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Pennsylvania Ten-Ton Tomato Club Report for 1943

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Pennsylvania Ten-Ton Tomato Project

Sponsored by

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Vice-President .....Louis Orient, Bridgeville
Sec'y-Treas......Jesse M. Huffington, 625 Holmes St., State College
Directors.....R. R. Comly, Bustleton
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Juniata Cannery, McAlisterville, Pa.
Keystone Grape Co-op. Ass'n, North East, Pa

Pennsylvania Ten-Ton Tomato Project

PURPOSE

The production of high quality tomatoes with large yields per acre and efficient use of labor and cash in growing, harvesting and marketing the crop is encouraged by reporting actual practices of successful growers.

MEMBERSHIP AND AWARDS

All tomato growers in Pennsylvania producing one or more acres, whose receipts for tomatoes sold from these acres to the cannery, or in the open market, show a production of 10 or more tons per acre are eligible for membership, provided satisfactory evidence is presented to the Committee.

Recording production practices is encouraged by awarding certificates designated as A-1 or B-1 to growers who present such a record. Class A certificates are awarded to growers who delivered an average of over 60 per cent U. S. grade number one tomatoes during the season, and class B certificates to growers who sold on an ungraded basis or whose average grade for the season was less than 60 per cent U. S. number one tomatoes. Record forms, as printed in this report, may be obtained from the County Agricultural Extension Agent, and should be returned to him by November first. Fieldmen, also, assist in assembling these records.

Special awards are presented to the highest three, in yield, 2 to 7, and three, 7 or more acres, and quality, three, 2 to 7 and three, 7 or more acres, respectively.

The requirements of membership may be revised by the committee and suggestions are appreciated.

ORGANIZATION

The Pennsylvania Vegetable Growers' Association sponsors the project, issues certificates of merit, presents awards for the best quality and the largest yields per acre, publishes this report, and arranges programs of special meetings, particularly the Annual Meeting at Harrisburg.

The Agricultural Extension Service of The Pennsylvania State College, through County Agricultural Extension Associations, demonstrates better production and harvesting practices, assists in obtaining and summarizing records of practices followed by growers, and presents educational information.

Canners assist by supplying lists of their ten-ton tomato growers, purchasing reports for distribution, and contributing cash to cover awards and other expenses.

.....**County, Tomato Production Practices, 1944**

Grower .....

Address ..... R.D.....

Contractor ..... Address.....

Total Acreage ..... Witness.....

If in doubt about your acreage, draw a diagram, giving dimensions.

Yield per Acre.....tons; % U. S. 1's..... 2's..... culls.....

Cannery Receipts..... Market Sales..... (Submit sales record)

Soil: Date plowed..... Depth..... Drainage?..... Type.....

Rotation: 1941....., 1942....., 1943.....

Winter Cover Crops: Before..... After..... Tomatoes

Preparation: Times Disced..... Harrowed..... Rolled/Dragged.....

Manure: Tons or loads per acre?..... Kind..... When applied.....

Lime: Lime requirement for pH test?.....When last applied?.....

Kind?..... Amount per acre?.....

Fertilizer: Analyses..... Pounds per Acre.....

How Applied? Plowed under..... Drilled..... Row..... Side Dressed.....

Plant Starter: Used..... Analyses..... lbs. to 50 gallons.....

Plants: Variety..... Source.....

Grown in Field?..... Frame?..... Greenhouse-Frame?.....

Held.....days before planting. Condition when set.....

Planting: Date..... Hand or transplanter..... Water used.....

Number of plants used: First planting..... Replanting.....

Cutworm bait used..... Sprayed/Dusted.....times for.....

Spacing: Rows..... Plants..... Final Stand.....%

Cultivation: Number of times..... horse or tractor? Hand weeded.....

Was the first cultivation close to the plants?..... Deep?.....

Days from setting to first cultivation.....

Were later cultivations deep or shallow?..... Ridge?.....

Were roots of tomato plants cut off by deep cultivation?.....

Harvesting: No. family labor..... hired..... Rate of pay.....

Hauling: Hired @ $..... Ton; own truck..... Av. load.....

Miles round trip.....; Hours on trip.....; Hours to unload.....

Date..... Signed.....

Please Fill Out and Mail to Your County Agent by Nov. 1.

Highest Quality Tomatoes Harvested in 1943

Two to Seven Acres

Name *Address*	*Class Cert.*	*Acres Grown*	*Tons per A.*	*U. S. Grade % 1's*	*2's*	*Culls*
First—Northumberland County Moore, Charles S., Sunbury, R. 1	A-1	2	13.14	94	6	0
Second—Northumberland County Hoffman, Cline, Muncy, R. 3	A-1	4	13.56	92	8	0
Third—Lancaster County Musser, A. K., Columbia, R. 2	A-1	2	13.03	92	8	0

Seven or More Acres

First—Columbia County Howell, Ray, Bloomsburg, R. D.	A-1	10	17.8	88	11	1
Second—Columbia County Moser, Ralph L., Ringtown	A-1	7.25	13.36	86	14	0
Third—Lancaster County Frey, Armor P., Conestoga, R. 2	A-1	18	14.80	85	15	0

Largest Yields of Tomatoes Produced in 1943

Two to Seven Acres

Name *Address*	*Class Cert.*	*Acres Grown*	*Tons per A.*	*U. S. Grade % 1's*	*2's*	*Culls*
First—Lancaster County Stoltzfus, John F., Elverson, R. 2	A-1	4.6	24.4	75	24	1
Second—Lancaster County Hollinger, Noah, Goodville	A-1	4	20.30	72	27	1
Third—York County Markey, R. E., York, R. 2	B-1	3	19.5			

Seven or More Acres

First—Erie County Short Farm (Wagner, L. J.) North East	A-1	7.7	23.30	74	23	3
Second—Bucks County Stackhouse, Arthur H., Yardley	A-1	8	18.63	63	35	2
Third—Columbia County Howell, Ray, Bloomsburg, R. D.	A-1	10	17.8	88	11	1

Methods Used in Producing Highest Quality Tomatoes

Two to Seven Acres

By CHARLES S. MOORE, Sunbury, R. 1
First—Northumberland County, 94% U. S. No. 1's.

VARIETY—Rutgers.

PLANTS—Southern, arrived in good condition, set at once.

MANURE—5 tons per acre, stable and chicken, and 4 tons preceding year.

SOIL—Gravel loam, well-drained.

ROTATION—Oats, Corn, Tomatoes.

Highest Quality Production Practices, 2-7 Acres (Continued)

PLOWED—April 11, 10 inches deep.

FERTILIZER—600 lbs. per acre, 3-12-6, drilled after plowing.

PLANTING—May 17, transplanting 6 inches deep. No water used. Moist soil. Spaced 4 x 4 feet.

CULTIVATION—Three times; weeded by hand once.

PICKING—Three in family, 1 hired.

HAULING—A truck used, 3¼ tons, 18 miles, 4 hours, round trip.

By CLINE HOFFMAN, Muncy, R. 3
Second—Northumberland County, 92% U. S. No. 1's.

VARIETY—Rutgers.

PLANTS—Southern, good and bad, held 1 to 2 days.

MANURE—14 tons per acre before tomatoes and 12 tons preceding year.

SOIL—Light sandy loam.

ROTATION—Wheat, hay, corn, tomatoes.

PLOWED—May 1, 8 inches deep.

FERTILIZER—4-10-10 and 3-12-6 drilled after plowing, 700 lbs. per acre.

PLANTING—May 18, by hand, in moist soil without water, stand 90%, spacing 4 x 4 feet.

CULTIVATION—4 times.

PICKING PERIOD—August 20 - October 19.

PICKERS—30% family, 70% hired.

By A. K. MUSSER, Columbia, R. 2.
Third—Lancaster County, 92% U. S. No. 1's.

VARIETY—Rutgers.

PLANTS—Muslin frame at home. Set at once after pulling.

MANURE—10 tons per acre, stable.

ROTATION—Alfalfa 3 years preceding tomatoes.

PLOWED—May 10, 9 inches deep.

FERTILIZER—3-12-6 and tankage, equal amounts, 1700 lbs. per acre, drilled after plowing; starter solution used.

PLANTING—June 1, transplanter, moist soil, with water.

SPACING—39 x 36 inches with 99% stand.

CULTIVATION—5 times, hand weeded once.

TOMATOES are heavy users of plant food. Chemical analysis of the plant and fruit show that more potash is used than phosphoric acid and nitrogen combined. When more than 600 pounds of fertilizer per acre are used, broadcast at least half before plowing. The balance should be applied in bands beside the rows at planting time. On soils of medium fertility, a side-dressing when the fruit is beginning to set is recommended. High-potash fertilizers, if properly applied, insure large yields of high-quality tomatoes.

AMERICAN POTASH INSTITUTE, INC.

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Highest Quality Production Practices, 7 or More Acres (Continued)

By RAY HOWELL, Bloomsburg, R. D.
Frist—Columbia County, 88% U. S. No. 1's.

VARIETY—Rutgers.

PLANTS—Greenhouse, tender, held 14 days in flat.

MANURE—16 tons per acre, chicken and stable.

SOIL—Red shale, well-drained.

ROTATION—Oats, wheat, tomatoes.

PLOWED—May 7, 8 inches deep.

FERTILIZER—0-20-20, 400 lbs. per acre, applied before plowing, and 20% superphosphate, after plowing with the planter. Starter solution used.

PLANTING—May 28, planter, 4 inches deep, water applied; cutworm bait used.

CULTIVATION—Three times, hand weeded once.

PICKING PERIOD—August 24 - October 8, all pickers hired.

HAULING—Own truck used, 3½ tons, 7 miles round trip, 2 hours' trip.

By RALPH L. MOSER, Ringtown
Second—Columbia County, 86% U. S. No. 1's.

VARIETY—Marglobe.

PLANTS—Greenhouse, set at once.

MANURE—4 tons per acre, mixed.

SOIL—Well drained.

ROTATION—Wheat, timothy sod, tomatoes.

PLOWED—April 15, 7 inches deep, fitted 5 days after plowing.

LIME—One-half ton ground limestone per acre.

FERTILIZER—1600 lbs., 20% superphosphate drilled after plowing and 500 lbs. 4-10-10 side dressed 30 days after planting.

PLANTING—May 24, hand 3 inches deep, moist soil. No water applied.

CULTIVATION—Deep at first, then shallow, hand weeded once.

PICKING—Mostly hired by the hour.

HAULING—Own 3½-ton truck, 11 miles, 3 hours.

By ARMOR P. FRED, Conestoga, R. 2
Third—Lancaster County, 85% U. S. No. 1's.

VARIETY—Rutgers.

PLANTS—Southern, set at once upon arrival.

MANURE—20 tons per acre, steer; also, an application was made 1940, '41 & '42.

ROTATION—Corn, corn and barley—tomatoes and barley.

PLOWED—April 25, 7 to 8 inches deep; disced 2, harrowed 4 and rolled 2 times.

FERTILIZER—900 lbs. 0-14-6 applied before plowing.

PLANTING—May 15.

SPACING—Rows 4 and plants 4 feet apart, 97% stand.

CULTIVATION—Three times, weeded by hand once.

Methods Used in Producing Largest Yields of Tomatoes

Two to Seven Acres

By JOHN F. STOLTZFUS, Elverson, R. 2.

First—Lancaster County, 4.6 acres, 24.4 tons per acre.

VARIETY—Rutgers and Marglobe.
PLANTS—Southern.
MANURE—12 tons per acre, cow.
SOIL—Well drained, good fertility.
ROTATION—Sod and tomatoes.
FERTILIZER—3-12-6, 400 lbs. per acre broadcast after plowing.
PLANTING—May 17, transplanter, water applied.
SPACING—3 x 5 feet.

By NOAH HOLLINGER, Goodville

Second—Lancaster County, 4 acres, 20.3 tons per acre.

VARIETY—Marglobe.
PLANTS—Southern.
MANURE—10 tons per acre, cow.
SOIL—Good drainage and fertile.
ROTATION—Corn—tomatoes.
FERTILIZER—3-12-6, 600 lbs. per acre broadcast and 250 lbs. side of row.
PLANTING—May 20, water applied.
SPACING—3 x 4½ feet.

By R. E. MARKEY, York, R. 2

Third—York County, 3 acres, 19.5 tons per acre.

VARIETY—Rutgers.
PLANTS—One-half southern, one-half home grown; fair condition, medium size.
ROTATION—Corn, tomatoes—tomatoes.
MANURE—12 tons hog manure per acre.
COVER CROP—Ryegrass.
PLOWED—April 20, 10 inches.
PREPARATION—Disced and rolled 4 times.
FERTILIZER—5-10-5, 1500 lbs. per acre, applied broadcast after plowing. Plant starter was used.
SPACING—4 feet between rows and 3 between plants.
HARVESTING—Family and regular farm labor.
HAULING—Own truck; 3500 lbs. load; average waiting time at cannery one-half hour.

By L. J. WAGNER, North East

First—Erie County, 23.3 tons per acre.

VARIETY—Rutgers.
PLANTS—Greenhouse, local, arrived in good condition, set at once.
SOIL—Sandy loam, well drained.
ROTATION—Ryegrass sod—tomatoes.
PLOWED—October, 6 inches deep.
FERTILIZER—700 lbs. 4-12-6 applied before plowing, 300 lbs. drilled after plowing; 20% superphosphate (8 lbs. in 50 gallons of water) used as plant starter.
PLANTING—May 28, transplanter 3 inches deep, moist soil, water applied.
SPACING—5½ feet between rows and 3 feet between plants; 99% stand.
CULTIVATION—Three times, weeded by hand once.
PICKING—Hired at 50c per hour.
HAULING—Own truck, 4½-ton, 6 miles, 2 hours.

By ARTHUR STACKHOUSE

Second—Bucks County, 18.63 tons per acre.

VARIETY—Rutgers.
PLANTS—Southern.
MANURE—12 tons per acre.
SOIL—Medium (YB) loam, good drainage and fertility.
ROTATION—Corn—tomatoes.
LIME—pH 5.9, one ton ground limestone per acre plowed down.
FERTILIZER—600 lbs. per acre of 3-12-6 applied along the row, 400 lbs. 4-10-10 and 0-12-7 side-dressed.
PLANTING—May 9.
SPACING—4 x 4 feet.

By RAY HOWELL, Ringtown

Third—Columbia County, 17.8 tons per acre.

Record above—See *First*, quality, 7 or more acres.

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Ten-Ton Tomato Practices, 1943

Number recorded—977.

Total acreage recorded—3,022; average per farm—3.16.

Total tomato acreage in Pennsylvania, 1943—31,500 (Market—2,900).

Rank: Acreage—6th; yield per acre—5th.

Average yield per acre, all acreage: 6.6 tons (220 bushels).

VATIETIES: Rutgers; small plantings of Early Canner, Garden State, Marglobe, Stokesdale, and John Baer.

SOURCE OF PLANTS: Southern—499; local—103.

MANURE: Tons per acre, average— 8.75
10-15 ton yields— 8.4
15-20 ton yields—11.3

LIME: Applied by 162 growers.

COVER CROPS: Sod—120; small grain—71; ryegrass—50 (incomplete records).

ROTATION: Crops preceding tomatoes: corn—205, sod—123, small grains—42, tomatoes, potatoes, tobacco—30, truck crops—25, soybeans—5.

DATE OF PLOWING: By April 30—188, May 1 to 15—50, May 15 to 30—12, not plowed—1.

SOIL FITTING: Disced/harrowed: 1 to 2 times—32, 3 to 4—83, 5 to 6 or more—67. Rolled/dragged: 1 to 2 times—101, 3 to 4—36, 5 to 6—5.

FERTILIZER: Analyses: 3-12-6—279, 4-16-4—105,4, 4-10-10—82, 2-12-6—50.
Amount of plant food in fertilizer:
Average—186, or 886 lbs. of a 21-unit fertilizer
10-15 ton yields—184, or 876 lbs. of a 21-unit fertilizer
15-20 ton yields—203, or 967 lbs. of a 21-unit fertilizer.
Larger amounts of fertilizer were used where less manure was available.

HOW FERTILIZER WAS APPLIED: Broadcast (Drill)—263, row—103, broadcast (drill) and side dressed—90, row and side dressed—73, broadcast (drill) and row—67, side dressed—18.

PLANT STARTER: Records incomplete—107 used, 1 did not.

METHOD OF PLANTING: Transplanter—429, hand—113.

DATE OF PLANTING, BY AREAS:
Bucks-Lehigh—April 15-30, 2; May 1-15, 61; May 15-30, 31.
Berks-Lebanon-Lancaster—May 1-15, 106; May 15-31, 164; June 1, 3.
York-Franklin-Cumberland—May 1-15, 11; May 15-31, 57; June 1, 3.
Juniata-Mifflin-Blair—May 1-15, 2; May 15-31, 19; June 1—2.
Columbia-Snyder-Lycoming—May 1-15, 3; May 15-31, 47; June 1, 6.
Pennsylvania—April 15-30, 2; May 1-15, 183; May 15-31, 318; June 1, 14.

WM. H. STATES, JR.

PRODUCE HAULING

BRISTOL, PENNA.

Ten-Ton Tomato Growers in 28 Counties, 1943

County	Classification*				Total
	A-1	A	B-1	B	
Adams		52	2		54
Bedford		1	1		2
Berks	21		2	2	25
Blair	5	1	9	1	16
Bucks	79	9	9		97
Carbon			2		2
Chester	18			10	28
Columbia	28	6			34
Cumberland	9	5			14
Delaware	1				1
Erie	15	7	10	10	42
Franklin	15	1		2	18
Huntingdon	3				3
Juniata	7	3			10
Lancaster	191	106	52	32	381
Lebanon	51	1			52
Lehigh	4				4
Luzerne	11	2			13
Lycoming	8	4			12
Mifflin	8	3			11
Montgomery	3		1		4
Montour	2	4			6
Northampton	2				2
Northumberland	8	4			12
Schuylkill	2	2	12	7	23
Snyder	8	5	3		16
Union	9		1		10
York	15	24	21	4	85
TOTAL	527	250	132	68	977

*** Classification: A, 60%, or more, U.S. 1's; B, less than 60% U.S. 1's or ungrades; A-1, B-1, record of production practices used in the summary (p.12).**
Twenty-one received after map (p. 14) was sent to the engraver.

Tomato growers cannot afford to do without supervisors for pickers. On the Short Farm, North East, Erie County, L. J. Wagner and his supervisors distribute baskets and carry the filled ones to drive-ways. High School students were transported by bus after school hours and paid 50 cents per hour for picking a 23.3 ton per acre crop on 7.7 acres with 74% U. S. 1's.

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Blair	5	1	9	1	16
Bucks	79	9	9		97
Carbon			2		2
Chester	18			10	28
Columbia	28	6			34
Cumberland	9	5			14
Delaware	1				1
Erie	15	7	10	10	42
Franklin	15	1		2	18
Huntingdon	3				3
Juniata	7	3			10
Lancaster	191	106	52	32	381
Lebanon	51	1			52
Lehigh	4				4
Luzerne	11	2			13
Lycoming	8	4			12
Mifflin	8	3			11
Montgomery	3		1		4
Montour	2	4			6
Northampton	2				2
Northumberland	8	4			12
Schuylkill	2	2	12	7	23
Snyder	8	5	3		16
Union	9		1		10
York	15	24	21	4	85
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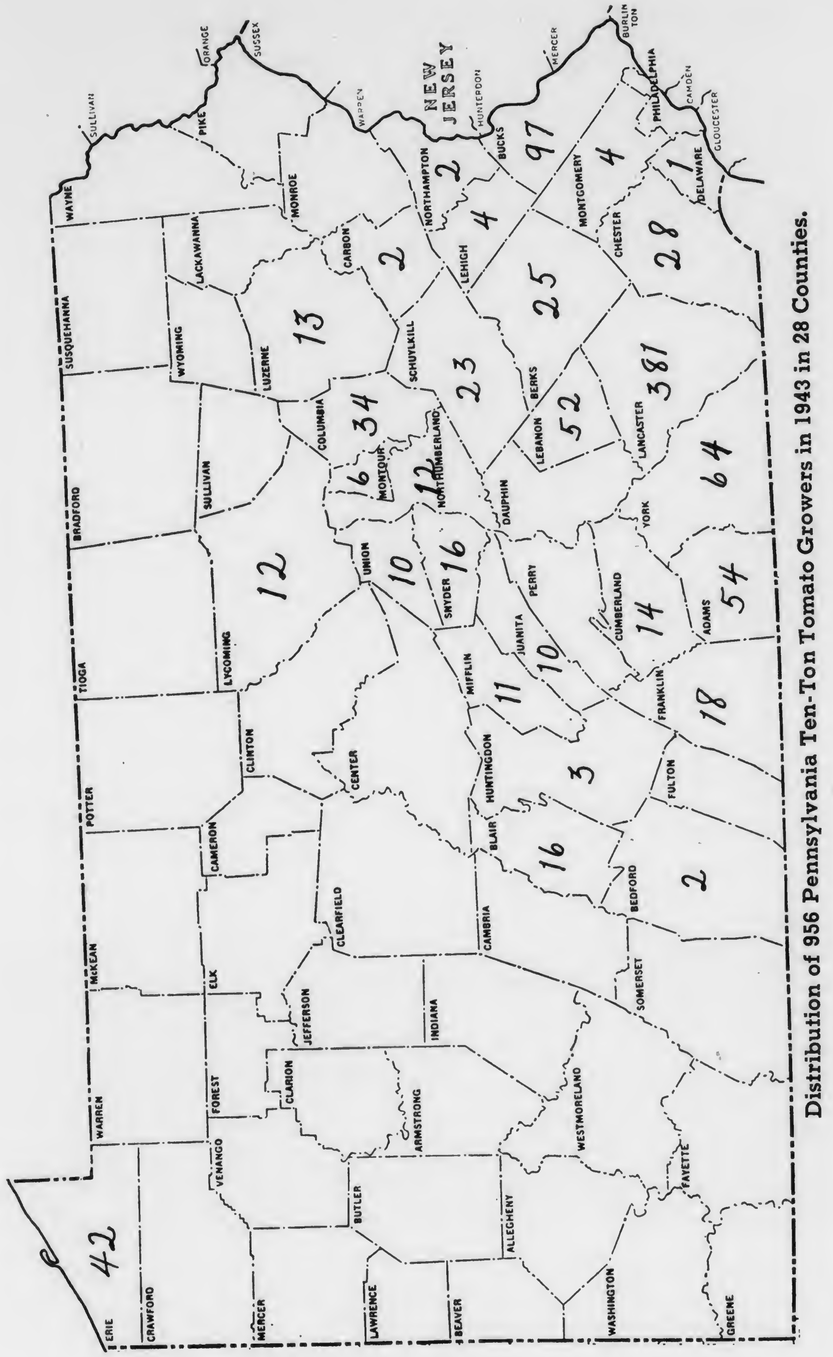
Tomato growers cannot afford to do without supervisors for pickers. On the Short Farm, North East, Erie County, L. J. Wagner and his supervisors distribute baskets and carry the filled ones to drive-ways. High School students were transported by bus after school hours and paid 50 cents per hour for picking a 23.3 ton per acre crop on 7.7 acres with 74% U. S. 1's.

INTENTIONAL SECOND EXPOSURE



Distribution of 956 Pennsylvania Ten-Ton Tomato Growers in 1943 in 28 Counties.

Pennsylvania Ten-Ton Tomato Growers in 1943

ADAMS COUNTY						
Bange, Aaron N., Hanover, R. 4	B-1	1	12.11	67	31	2
Black, Carl F., Gardners, R. 2	A	3	12.04	67		
Black, Nelson, Biglerville	A	2.67	12.05	73		
Brough, Donald, York Springs	A	2.7	10.51	75		
Davis, Harold, York Springs, R. 1	A	2	15.70	74	26	
Davis, Ralph, York Springs	A	1.9	12.59	81	19	
Dively, Victor, Biglerville, R. 1	A	2	10.13	65		
Dunlap, Harry, Biglerville, R. 1	A	5.75	11.22	79		
G. M. W. Orchard, Gardners	A	3.88	10.53	64		
Gardner, Percy, Gardners, R. 1	A	2	11.5	87	13	0
Garretson, John, Aspers, R. 1	A	3	11.81	73		
Golden, C. I., Gardners	A	1.75	11.18	75		
Griest, Fred, Flora Dale	A	2.63	17.08	73		
Guise, John W., Gardners	A	2.5	11.23	73		
Harbold, Ervin, York Springs	A	3.64	16.24	80		
Harbold, Ervin, York Springs, R. 1	A	1.25	16.16	76		
Harbold, Wm. H., York Springs	A	2.83	12.72	74		
Hikes, Elmer, Gardners, R. 1	A	3	15.82	86	14	
Johnson, Geo., York Springs, R. 1	A	3.58	18.87	83		
King, Charles, York Springs, R. 1	A	1.5	17.34	72		
Kline, Howard, Biglerville	A	1.84	10.8	64		
Knouse, A. Dale, Biglerville	A	4.29	12.25	83		
Kuntz, Parker & Sons, Gardners	A	2.88	15.09	73		
Leer, William, York Springs, R. 1	A	1	14.12	74	26	
Lerew, Parker, York Springs	A	5.44	18.72	86		
Lerew, Paul B., York Springs, R. 1	A	1	17.61	75		
Lobaugh, Adam & Guy, Gardners	A	4.48	13.69	76		
Lory, L. E., York Springs	A	2.31	19.54	77		
Miller, Gilbert, York Springs, R. 2	A	1.75	11.15	80	20	
Miller, Herbert, Biglerville	A	1	12.56	88	12	
Murren, Francis, Hanover, R. 4	A	2.2	10.00	77		
Peters, Curtis, Biglerville	A	2	12.2	72		
Peters, Julia, Gettysburg	A	1.11	11.15	88		
Prickett Estate, Biglerville	A	3.04	11.80	74		
Rupp, Lloyd, York Springs	A	3	12.29	69		
Schmick, John, Gardners, R. 1	A	2.09	13.88	73		
Shank, Jacob D., Hanover, R. 3	A	2.05	10.01	75		
Sheaffer, Amos, Biglerville	A	3.72	12.80	74		
Showers, Ray, Biglerville, R. 1	A	4	12.95	81	19	
Shriver & Showers, Bendersville	A	5.11	13.29	76		
Slaybaugh, Chas., Gardners, R. 1	A	1	16.5	77	23	0
Small, Norbert J., Hanover, R. 4	B-1	2	10.70	62	37	1
Smith, Chas., York Springs, R. 2	A	2.5	18.31	80	20	
Smith, Wm., Aspers	A	2.35	10.04	76		
Sowers, H. W., York Springs	A	1.43	17.13	78		
Spangler, Harry, York Springs	A	1.77	13.79	80		
Spertzel, Chas., York Springs, R. 1	A	3	14.77	80	20	
Starner, John, Gardners, R. 2	A	2	18.25	84	16	0
Strayer, Lewis M., York Springs	A	2.1	11.82	72		
Thomas, B. F., Aspers, R 1.	A	1	10.26	79		
Tuckey, Burton & Jesse, Biglerville, R. 1	A	5.75	12.51	73		
Tuckey, Emory, Biglerville	A	2.41	18.65	86		
Weaner, Chas., Bendersville	A	2	10.70	81		
Williams, L. A., York Springs, R. 1	A	1.73	13.55	75		

BEDFORD COUNTY

Beach, J. F., Woodbury	B-1	2.75	10.46	53	45	2
Frederick, Daniel, Curryville	A	2	10.10	63	36	1

BERKS COUNTY

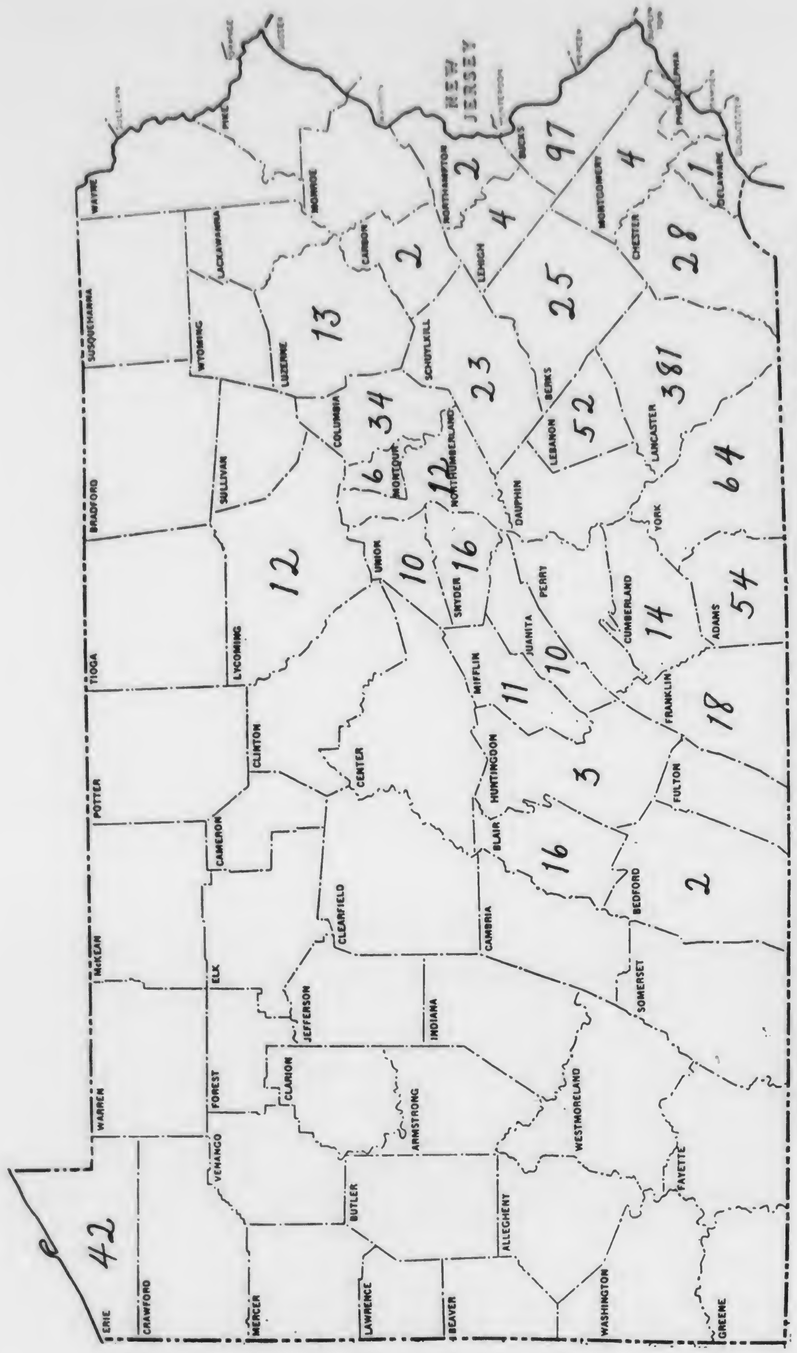
Beam, William, Morgantown	B	4	10.82			
Braucher, S. W., Fleetwood, R. 2	A-1	5	10.14	71	29	0
Brown, Henry G., Bethel, R. 1	A-1	4.94	10.15	73	26	1
Fenstermacher, John W., Mertztown, R. 1	A-1	5.5	12.87	71	28	1
Glick, John L., Boyertown, R. 2	A-1	4.25	11.18	74	25	1
Hafer, George H., Yellow House	A-1	8	11.02	73	27	0
Jacob, H. R., 205 E. Lancaster Avenue, Ardmore	A-1	7	12.58	71	28	1
Kerr, M. H., Virginville, Box 66	B-1	7	10.41	57	39	4
King, Myron A., Elverson, R. 2	A-1	3	11.41	82	17	1
Kurtz, Abram E., Elverson, R. 2	A-1	4.5	12.79	75	24	1
Levengood, Ralph E., Douglassville, R. 2	A-1	3	11.89	74	24	2
Mast, Elam E., Elverson, R. 2	A-1	4	13.61	69	30	1
Rhoads, W. D., Boyertown, R. 2	A-1	5	10.05	78	22	0
Ruth, John F., Stouchsburg	A-1	5.5	14.89	72	27	1
Schlegel, Paul H., Boyertown, R. 2	A-1	5.67	12.26	76	23	1
Slichter, W. A., Morgantown	B	5	11.74			
Stoltzfus, David M., Elverson, R. 2	A-1	15	13.54	68	30	2
Stoltzfus, Job, Elverson, R. 2	A-1	6	14.58	71	27	2
Stoltzfus, Levi M., Elverson, R. 2	A-1	9.5	10.20	64	34	2
Stoltzfus, Samuel F., Morgantown	A-1	4.5	14.80	71	27	2
Stoltzfus, Stephen H., Joanna	A-1	3	11.15	66	32	2
Swartzentruber, Allen, Mertztown, R. 1	A-1	7	13.37	76	23	1
Weiss, Howard S., Boyertown, R. 2	A-1	3	10.7	70	28	2
Zook, Omar, Manatawny	A-1	15	12.49	69	30	1

BLAIR COUNTY

Becktel, Glenn A., Curryville	A-1	1.9	15.79	68	31	1
Bridenbaugh, E,. Martinsburg, R. 1	B-1	3	13.81	34	65	1
Bridenbaugh, H., Martinsburg, R. 1	B-1	3	11.85	54	44	0
Brumbaugh, Ellis M., Martinsburg, R. 2	B-1	2	12.87	50	48	2
Brumbaugh, Robert, Curryville	A-1	2	10.81	69	31	0
Creps, Ira, Martinsburg, R. 1	A-1	2	12.21	61	38	0
Dilling, E. C., Martinsburg, R. 2	B-1	2	12.86	48	51	1
Heltzel, H., Martinsburg, R. 2	A-1	2	13.61	69	31	0
Hershberger, C. A., & Paul P. Zook, Martinsburg	B	2.5	10.79	45	53	2
Hershberger, J. W., Martinsburg	B-1	1.17	13.75	46	50	4
Hoover, Robt. E., Martinsburg, R. 2	B-1	1.75	10.92	48	51	1
Keith, John N., Curryville	A	2.5	10.6	66	32	2
Metz, John O., Martinsburg, R. 2	B-1	2	12.51	52	47	1
Nicodemus, R. V., Martinsburg, R. 1	B-1	2	10.86	54	46	0
Smith, C. L., Roaring Springs, R. 1	A-1	2	12.58	61	37	2
Stonerook, D. I., Martinsburg, R. 1	B-1	3.5	10.41	49	50	1

BUCKS COUNTY

Atha, Roy, Ivyland	A-1	7.5	16.69	68	30	2
Basara, Stephen, Bristol, R. 1	A-1	8.5	10.40	73	26	1
Beatty, Joshua W., Hatboro, R. D.	A-1	4	15.21	68	31	1
Beck, Newton, Mechanicsville	A-1	16	12.31	64	33	3
Bloomfield, Joseph E., Oakford	A-1	14	12.03	64	34	2
Brickajlik, John, Sellersville, R. 1, Box 35	A-1	30	10.19	72	26	2
Brinker, William, Chalfont, R. D.	A-1	8	10.01	66	33	1
Buckman, Ernest L., Doylestown	A-1	14	12.21	60	36	4
Carter, J. W. and Waldo W., Langhorne, R. D.	A-1	14	13.78	73	25	2
Carter, Russell F., Yardley	A-1	10	13.33	66	31	3
Chapman, Harry, Bristol, R. D.	A-1	14	10.67	69	29	2
Checchia, Rose M., Bristol, R. 2	A-1	6.5	11.50	75	24	1
Cornell, Leigh P., Feasterville	A-1	5.5	10.86	73	26	1
Cornell, Norman S., Warrington	A-1	6	12.25	78	22	0
Cregar, Lemuel C., Yardley, R. D.	A-1	8	10.62	71	26	3
Detweiler, C. L. & Clarence M. Detweiler, Hatboro, R. D.	A-1	20	12.08	62	36	2
Doan Brothers, Woodside	A	9.5	15.5	69	28	3
Doan, Duane D. & Marcus B. Doan, Yardley, R. 1	A-1	10	14.06	80	19	1
Drager, Adolph H., Yardley	A-1	9	11.25	64	34	2
Dybiak, Stephen, Sellersville, R. 1, Box 41	A-1	6	11.24	78	21	1
Elder, Joseph, Bristol, R. D.	A	3.5	11.38	74	24	2
Edwards, Furman A., Ivyland	A-1	5.5	10.03	68	31	1
Fink, Mathias, Newtown, R. D.	A-1	8.25	14.25	67	32	1
Garges, Howard, Chalfont	A-1	5	13.97	70	28	2
Garges, Howard S., Hilltown	A-1	4	11.21	70	28	2
Geissinger, Clarence L., Quakertown, R. 2	A-1	10.5	15.56	62	36	2
Gocolinski, Frank, Langhorne, R. 2	A-1	6.25	10.30	63	36	1
Gray, Charles W., Jr., Davisville	A-1	9	11.69	69	29	2
Greenberg, A., Doylestown, R. 2	A-1	18	11.48	66	32	2
Guzikowski, Edward, Woodside	A-1	18	15.60	67	31	2
Guzikowski, Marjan, Yardley, R. 1	A-1	23	11.65	67	31	2
Haldeman, B. Harrison, Danboro	A-1	6.5	13.75	66	32	2
Heppe, Raymond, Davisville	A-1	12	13.39	68	29	3
Herman, Joseph, Riegelsville	A-1	5	13.24	87	12	1
Heston, Isaiah, Woodside	A	11	13.93	72	23	5
Heuscher, Herman G., Ivyland	A-1	5	16.66	81	18	1
Heuscher, Philip C., Ivyland	A-1	5	19.05	74	25	1
Hunsberger, Rachel D., Chalfont, R. D.	A-1	6	12.64	73	26	1
Jackson, Andrew, Yardley	A-1	5.5	11.85	71	28	1
Jackson, John G. & Andrew Jackson, Yardley	A-1	11.75	10.48	74	25	1
Jackson, Wm. F., Morrisville, R. 2	A-1	8	12.50	74	25	1
Katona, Louis, Langhorne, R. 2	A-1	15	10.14	66	33	1
Kimbel, E. T., Jr., Rushland	A-1	7.5	10.17	65	34	1
Kirk, Leslie F., Newtown	A-1	9	13.17	72	27	1
Kitten, Harry B., Ivyland	A-1	8	12.18	69	30	1
Kolodziejski, L., Perkasie, R. 3	A-1	6	10.19	72	26	2
Kucowski, J. S., Morrisville, R. D.	A-1	8	13.46	70	28	2
Lancaster, Charles E., Jr., Bristol	B-1	5	10.89	57	39	4
Lang, Joseph, Yardley, R. D.	A-1	11	10.36	66	32	2
Lapp, Grant, New Britain	B-1	4	13.99	55	41	4
Largent, Frank, Ivyland, R. D.	B-1	3	11.80	58	38	4



Distribution of 956 Pennsylvania Ten-Ton Tomato Growers in 1943 in 28 Counties.

Pennsylvania Ten-Ton Tomato Growers in 1943

ADAMS COUNTY						
Bange, Aaron N., Hanover, R. 4	B-1	1	12.11	67	31	2
Black, Carl F., Gardners, R. 2	A	3	12.04	67		
Black, Nelson, Biglerville	A	2.67	12.05	73		
Brough, Donald, York Springs	A	2.7	10.51	75		
Davis, Harold, York Springs, R. 1	A	2	15.70	74	26	
Davis, Ralph, York Springs	A	1.9	12.59	81	19	
Dively, Victor, Biglerville, R. 1	A	2	10.13	65		
Dunlap, Harry, Biglerville, R. 1	A	5.75	11.22	79		
G. M. W. Orchard, Gardners	A	3.88	10.53	64		
Gardner, Percy, Gardners, R. 1	A	2	11.5	87	13	0
Garretson, John, Aspers, R. 1	A	3	11.81	73		
Golden, C. I., Gardners	A	1.75	11.18	75		
Griest, Fred, Flora Dale	A	2.63	17.08	73		
Guise, John W., Gardners	A	2.5	11.23	73		
Harbold, Ervin, York Springs	A	3.64	16.24	80		
Harbold, Ervin, York Springs, R. 1	A	1.25	16.16	76		
Harbold, Wm. H., York Springs	A	2.83	12.72	74		
Hikes, Elmer, Gardners, R. 1	A	3	15.82	86	14	
Johnson, Geo., York Springs, R. 1	A	3.58	18.87	83		
King, Charles, York Springs, R. 1	A	1.5	17.34	72		
Kline, Howard, Biglerville	A	1.84	10.8	64		
Knouse, A. Dale, Biglerville	A	4.29	12.25	83		
Kuntz, Parker & Sons, Gardners	A	2.88	15.09	73		
Leer, William, York Springs, R. 1	A	1	14.12	74	26	
Lerew, Parker, York Springs	A	5.44	18.72	86		
Lerew, Paul B., York Springs, R. 1	A	1	17.61	75		
Lobaugh, Adam & Guy, Gardners	A	4.48	13.69	76		
Lory, L. E., York Springs	A	2.31	19.54	77		
Miller, Gilbert, York Springs, R. 2	A	1.75	11.15	80	20	
Miller, Herbert, Biglerville	A	1	12.56	88	12	
Murren, Francis, Hanover, R. 4	A	2.2	10.00	77		
Peters, Curtis, Biglerville	A	2	12.2	72		
Peters, Julia, Gettysburg	A	1.11	11.15	88		
Prickett Estate, Biglerville	A	3.04	11.80	74		
Rupp, Lloyd, York Springs	A	3	12.29	69		
Schmick, John, Gardners, R. 1	A	2.09	13.88	73		
Shank, Jacob D., Hanover, R. 3	A	2.05	10.01	75		
Sheaffer, Amos, Biglerville	A	3.72	12.80	74		
Showers, Ray, Biglerville, R. 1	A	4	12.95	81	19	
Shriver & Showers, Bendersville	A	5.11	13.29	76		
Slaybaugh, Chas., Gardners, R. 1	A	1	16.5	77	23	0
Small, Norbert J., Hanover, R. 4	B-1	2	10.70	62	37	1
Smith, Chas., York Springs, R. 2	A	2.5	18.31	80	20	
Smith, Wm., Aspers	A	2.35	10.04	76		
Sowers, H. W., York Springs	A	1.43	17.13	78		
Spangler, Harry, York Springs	A	1.77	13.79	80		
Spertzel, Chas., York Springs, R. 1	A	3	14.77	80	20	
Starner, John, Gardners, R. 2	A	2	18.25	84	16	0
Strayer, Lewis M., York Springs	A	2.1	11.82	72		
Thomas, B. F., Aspers, R 1.	A	1	10.26	79		
Tuckey, Burton & Jesse, Biglerville, R. 1	A	5.75	12.51	73		
Tuckey, Emory, Biglerville	A	2.41	18.65	86		
Weaner, Chas., Bendersville	A	2	10.70	81		
Williams, L. A., York Springs, R. 1	A	1.73	13.55	75		

BEDFORD COUNTY

Beach, J. F., Woodbury	B-1	2.75	10.46	53	45	2
Frederick, Daniel, Curryville	A	2	10.10	63	36	1

BERKS COUNTY

Beam, William, Morgantown	B	4	10.82			
Braucher, S. W., Fleetwood, R. 2	A-1	5	10.14	71	29	0
Brown, Henry G., Bethel, R. 1	A-1	4.94	10.15	73	26	1
Fenstermacher, John W., Mertztown, R. 1	A-1	5.5	12.87	71	28	1
Glick, John L., Boyertown, R. 2	A-1	4.25	11.18	74	25	1
Hafer, George H., Yellow House	A-1	8	11.02	73	27	0
Jacob, H. R., 205 E. Lancaster Avenue, Ardmore	A-1	7	12.58	71	28	1
Kerr, M. H., Virginville, Box 66	B-1	7	10.41	57	39	4
King, Myron A., Elverson, R. 2	A-1	3	11.41	82	17	1
Kurtz, Abram E., Elverson, R. 2	A-1	4.5	12.79	75	24	1
Levengood, Ralph E., Douglassville, R. 2	A-1	3	11.89	74	24	2
Mast, Elam E., Elverson, R. 2	A-1	4	13.61	69	30	1
Rhoads, W. D., Boyertown, R. 2	A-1	5	10.05	78	22	0
Ruth, John F., Stouchsburg	A-1	5.5	14.89	72	27	1
Schlegel, Paul H., Boyertown, R. 2	A-1	5.67	12.26	76	23	1
Slichter, W. A., Morgantown	B	5	11.74			
Stoltzfus, David M., Elverson, R. 2	A-1	15	13.54	68	30	2
Stoltzfus, Job, Elverson, R. 2	A-1	6	14.58	71	27	2
Stoltzfus, Levi M., Elverson, R. 2	A-1	9.5	10.20	64	34	2
Stoltzfus, Samuel F., Morgantown	A-1	4.5	14.80	71	27	2
Stoltzfus, Stephen H., Joanna	A-1	3	11.15	66	32	2
Swartzentruber, Allen, Mertztown, R. 1	A-1	7	13.37	76	23	1
Weiss, Howard S., Boyertown, R. 2	A-1	3	10.7	70	28	2
Zook, Omar, Manatawny	A-1	15	12.49	69	30	1

BLAIR COUNTY

Becktel, Glenn A., Curryville	A-1	1.9	15.79	68	31	1
Bridenbaugh, E,. Martinsburg, R. 1	B-1	3	13.81	34	65	1
Bridenbaugh, H., Martinsburg, R. 1	B-1	3	11.85	54	44	0
Brumbaugh, Ellis M., Martinsburg, R. 2	B-1	2	12.87	50	48	2
Brumbaugh, Robert, Curryville	A-1	2	10.81	69	31	0
Creps, Ira, Martinsburg, R. 1	A-1	2	12.21	61	38	0
Dilling, E. C., Martinsburg, R. 2	B-1	2	12.86	48	51	1
Heltzel, H., Martinsburg, R. 2	A-1	2	13.61	69	31	0
Hershberger, C. A., & Paul P. Zook, Martinsburg	B	2.5	10.79	45	53	2
Hershberger, J. W., Martinsburg	B-1	1.17	13.75	46	50	4
Hoover, Robt. E., Martinsburg, R. 2	B-1	1.75	10.92	48	51	1
Keith, John N., Curryville	A	2.5	10.6	66	32	2
Metz, John O., Martinsburg, R. 2	B-1	2	12.51	52	47	1
Nicodemus, R. V., Martinsburg, R. 1	B-1	2	10.86	54	46	0
Smith, C. L., Roaring Springs, R. 1	A-1	2	12.58	61	37	2
Stonerook, D. I., Martinsburg, R. 1	B-1	3.5	10.41	49	50	1

BUCKS COUNTY

Atha, Roy, Ivyland	A-1	7.5	16.69	68	30	2
Basara, Stephen, Bristol, R. 1	A-1	8.5	10.40	73	26	1
Beatty, Joshua W., Hatboro, R. D.	A-1	4	15.21	68	31	1
Beck, Newton, Mechanicsville	A-1	16	12.31	64	33	3
Bloomfield, Joseph E., Oakford	A-1	14	12.03	64	34	2
Brickajlik, John, Sellersville, R. 1, Box 35	A-1	30	10.19	72	26	2
Brinker, William, Chalfont, R. D.	A-1	8	10.01	66	33	1
Buckman, Ernest L., Doylestown	A-1	14	12.21	60	36	4
Carter, J. W. and Waldo W., Langhorne, R. D.	A-1	14	13.78	73	25	2
Carter, Russell F., Yardley	A-1	10	13.33	66	31	3
Chapman, Harry, Bristol, R. D.	A-1	14	10.67	69	29	2
Checchia, Rose M., Bristol, R. 2	A-1	6.5	11.50	75	24	1
Cornell, Leigh P., Feasterville	A-1	5.5	10.86	73	26	1
Cornell, Norman S., Warrington	A-1	6	12.25	78	22	0
Cregar, Lemuel C., Yardley, R. D.	A-1	8	10.62	71	26	3
Detweiler, C. L. & Clarence M. Detweiler, Hatboro, R. D.	A-1	20	12.08	62	36	2
Doan Brothers, Woodside	A	9.5	15.5	69	28	3
Doan, Duane D. & Marcus B. Doan, Yardley, R. 1	A-1	10	14.06	80	19	1
Drager, Adolph H., Yardley	A-1	9	11.25	64	34	2
Dybiak, Stephen, Sellersville, R. 1, Box 41	A-1	6	11.24	78	21	1
Elder, Joseph, Bristol, R. D.	A	3.5	11.38	74	24	2
Edwards, Furman A., Ivyland	A-1	5.5	10.03	68	31	1
Fink, Mathias, Newtown, R. D.	A-1	8.25	14.25	67	32	1
Garges, Howard, Chalfont	A-1	5	13.97	70	28	2
Garges, Howard S., Hilltown	A-1	4	11.21	70	28	2
Geissinger, Clarence L., Quakertown, R. 2	A-1	10.5	15.56	62	36	2
Gocolinski, Frank, Langhorne, R. 2	A-1	6.25	10.30	63	36	1
Gray, Charles W., Jr., Davisville	A-1	9	11.69	69	29	2
Greenberg, A., Doylestown, R. 2	A-1	18	11.48	66	32	2
Guzikowski, Edward, Woodside	A-1	18	15.60	67	31	2
Guzikowski, Marjan, Yardley, R. 1	A-1	23	11.65	67	31	2
Haldeman, B. Harrison, Danboro	A-1	6.5	13.75	66	32	2
Heppe, Raymond, Davisville	A-1	12	13.39	68	29	3
Herman, Joseph, Riegelsville	A-1	5	13.24	87	12	1
Heston, Isaiah, Woodside	A	11	13.93	72	23	5
Heuscher, Herman G., Ivyland	A-1	5	16.66	81	18	1
Heuscher, Philip C., Ivyland	A-1	5	19.05	74	25	1
Hunsberger, Rachel D., Chalfont, R. D.	A-1	6	12.64	73	26	1
Jackson, Andrew, Yardley	A-1	5.5	11.85	71	28	1
Jackson, John G. & Andrew Jackson, Yardley	A-1	11.75	10.48	74	25	1
Jackson, Wm. F., Morrisville, R. 2	A-1	8	12.50	74	25	1
Katona, Louis, Langhorne, R. 2	A-1	15	10.14	66	33	1
Kimbel, E. T., Jr., Rushland	A-1	7.5	10.17	65	34	1
Kirk, Leslie F., Newtown	A-1	9	13.17	72	27	1
Kitten, Harry B., Ivyland	A-1	8	12.18	69	30	1
Kolodziejski, L., Perkasie, R. 3	A-1	6	10.19	72	26	2
Kucowski, J. S., Morrisville, R. D.	A-1	8	13.46	70	28	2
Lancaster, Charles E., Jr., Bristol	B-1	5	10.89	57	39	4
Lang, Joseph, Yardley, R. D.	A-1	11	10.36	66	32	2
Lapp, Grant, New Britain	B-1	4	13.99	55	41	4
Largent, Frank, Ivyland, R. D.	B-1	3	11.80	58	38	4

LaRue, George, Jr., Bristol, R. D.	A	5.75	10.85	65	35	5
Lewis, Wm. H., Jr., Perkasie, R. 3	A-1	3.5	10.11	71	27	2
Loch, Anthony, Fallsington	A-1	5	10.65	70	29	1
Lojeski, Alfred J. & Stanley T. Lojeski, Doylestown, R. 2	B-1	26	13.51	56	41	3
Loller, Roy, Johnsville	A-1	14	10.97	71	26	3
Longacre, H. R., Quakertown, R. 2	A-1	6	10.16	67	31	2
Lovett, H. L., Bristol, R. D.	A	4.75	17.16	76	22	2
Lovett, William, Bristol	B-1	24	12.59	59	38	3
Mastin, E. O., Quakertown, R. 3	A-1	35	13.98	62	34	4
Miscoski, Frank, Bristol, R. 1	A-1	10	11.25	68	30	2
Mood, Jonas, Kellers Church	A-1	7	11.59	64	35	1
Morrell, John, Bristol, R. D.	A	4.5	14.61	80	18	2
Myers, Clarence M., Chalfont, R. D.	A-1	3	13.92	66	31	3
Ostapowicz, Anthony, Bristol, R. 2	A-1	8.5	11.69	74	25	1
Ott, Elmer, Hatfield, R. 1	A-1	3	10.81	68	29	3
Pavelchak, Andrew S., Woodside	A-1	15	12.40	68	31	1
Permar, Samuel S., Richboro	A-1	10	10.08	67	31	2
Petryk, Tony, Coopersburg, R. 1	A-1	5	13.62	78	21	1
Pojokiewicz, Jos., Weisel, Box 40	A-1	3	16.98	64	34	2
Potter, Lawrence, Bristol, R. 2	A-1	8	10.15	65	33	2
Rickert, Peter, Chalfont, R. D.	A-1	4.5	10.08	71	27	2
Roberts, S., Morrisville, R. D.	A	3	13.61	71	25	4
Rohs, Stephen J., Hilltown	A-1	10	10.35	76	22	2
Rosenberger, H. G., Chalfont, R. 1	A-1	4	13.55	71	27	2
Rum, Andro, Yardley	A-1	10	11.24	68	30	2
Samuels, Herman, Warrington	A-1	19.5	13.36	66	32	2
Sansoni, Romano, Hatboro	A-1	7.5	12.16	71	27	2
Scudder, H. G., Yardley, R. 1	A-1	10.5	10.11	63	32	5
Shoemaker, E. H., Bristol	A-1	12	10.15	60	37	3
Slack, Josephine E., Forest Grove	A-1	6	10.82	71	27	2
Snyder, George D., Perkasie, R. 3	A-1	5	11.57	68	30	2
Solly, Walter J., Ivyland	A-1	28	12.54	77	22	1
Stackhouse, Arthur H., Yardley	A-1	8	18.33	63	35	2
Stalder, Anna, Ivyland, R. 1	B-1	18	10.58	59	38	3
Sytnik, Carl, Yardley	B-1	8	14.10	55	43	2
Thompson, Charles R., Newtown	A-1	8.5	11.00	63	35	2
Thompson, John C., Newtown	A-1	14	13.56	65	33	2
Tomlinson, Samuel F., Newtown	B-1	9	10.66	59	37	4
VanSant & Son, J. M., Bristol, R. D.	A	3.5	12.85	80	18	2
Vargo, S., Jr., Newtown, R. D.	A-1	10	13.08	74	25	1
Vasey, J. Howard & Jacob H. Vasey, Doylestown, R. 2	A-1	12.5	12.27	60	38	2
Walton, Joseph, Woodside	A	5.5	11.6	69	27	4
White, Daniel & Geo., Langhorne	A-1	15	10.30	78	20	2
White, William & William B. White, Cornwell Heights	A-1	10	10.32	72	27	1
Woodward, Chas. R., Bristol, R. 1	A-1	10	11.08	70	28	2
Zimmerman, Harry A., Ivyland	B-1	10.5	11.19	59	38	3
CARBON COUNTY						
McLean, Walter, Lehighton, R. 2	B-1	1	13.03			
Snyder, Guy, Lehighton, R. 1	B-1	2	11.61			
CHESTER COUNTY						
Buchanan, John, Honey Brook, R. 2	A-1	2.5	11.84	72	27	1
Burger, Elmer, Honey Brook, R. 2	A-1	3.25	15.38	73	26	1
Cockerham, Wilbur L., Lincoln Univ., R. 1	B	4.0	11.25			
Drennen, Wm., Cochranville, R. 2	B	4.0	10.55			

Faust, Harvey W., Collingdale, 217 Pusey Ave.	A-1	8.25	11.26	66	32	2
Frankhouser, John M., Honey Brook, R. D.	A-1	3.5	12.00	78	21	1
Given, L. J., Honey Brook, R. 1	A-1	5	11.76	84	16	0
Hood, Brinton L., West Grove, R. 1	B	3	10.98			
Kennel, A. M., Honey Brook, R. 1	A-1	18	10.95	73	26	1
King, A. B., Honey Brook, R. 2	A-1	3	12.97	71	28	1
Krapf, G., Jr., Downingtown, R. 1	B	4	10.88			
Mackey, R. S., West Grove, R. 1	B	3	14.66			
Mast, Jacob E., Elverson, R. 2	A-1	3.5	12.87	71	28	1
Musser, H. G., Honey Brook, R. 1	A-1	3	10.77	77	23	0
Neyman, Nelson, Oxford, R. 3	B	3	11.06			
Nissley, Ira, Honey Brook	A-1	6.5	13.58	67	32	1
Ohlinger, Emeline, Honey Brook, R. 1	A-1	2.5	11.38	77	22	1
Schapausky, H. D., Cochranville	B	3	11.49			
Smith, S. H., Cochranville, R. 2	B	3	13.57			
Stoltzfus, David, Elverson, R. D.	A-1	18	11.51	68	31	1
Stoltzfus, D. E., Honey Brook, R. 1	A-1	3.5	16.43	75	24	1
Stoltzfus, Jonas S., Suplee	A-1	3	12.12	76	23	1
Stoltzfus, S. J., Honey Brook, R. 1	A-1	4	10.56	71	27	2
Thompson, G. B., Oxford, R. 2	B	2	10.06			
Troop, John, Pottstown, R. 2	B	5	11.08			
Zimmerman, Phares S., Honey Brook, Star Route	A-1	4	10.36	79	21	0
Zook, Aaron J., Honey Brook, Star Route	A-1	4	12.26	71	27	2
Zook, Morris, Jr., Honey Brook, R. 1	A-1	10.5	12.96	75	23	2
COLUMBIA COUNTY						
Bolinsky, Joseph, Bloomsburg, R. 3	A-1	2	10.32	82	18	0
Bredbenner, S. L., Bloomsburg, R. 3	A-1	1.75	10.90	72	27	1
Bronson, Ralph, Bloomsburg, R. D.	A-1	3.75	10.11	77	21	2
Cherrington, A., Bloomsburg, R. 3	A-1	2	13.75	69	28	3
Cherrington, H., Orangeville, R. 1	A	1	10.00	73	21	6
Corell, Horace, Bloomsburg, R. 4	A	2	11.59	88	11	1
Correll, John, Bloomsburg, R. D.	A-1	4	15.45	90	10	0
Davis, John D., Zionsgrove	A-1	3	10.71	86	14	0
Edwards, R., Bloomsburg, R. 1	A-1	2.5	11.87	71	27	2
Elliott, Chas. W., Catawissa, R. 2	A-1	1.5	10.23	81	19	0
Fetterolf, Adam, Catawissa, R. 1	A	2.5	10.48	78	22	0
Fetterman, L., Catawissa, R. 2	A-1	3	10.30	82	18	0
Gassert, Hanley, Bloomsburg, R. 3	A-1	2	14.74	75	23	2
George, John, Catawissa, R. 2	A-1	3	11.3	80	19	1
Getty, Frank W., Catawissa, R. 2	A-1	3	10.19	82	18	0
Gottshall, Sam, Catawissa, R. 2	A-1	2	10.5	85	15	0
Howell, John, Bloomsburg, R. D.	A-1	4	15.4	86	14	0
Howell, Ray, Bloomsburg, R. D.	A-1	10	17.8	88	11	1
John, Harry G., Bloomsburg, R. 3	A-1	2	16.55	70	29	1
Karschner, C. O., Orangeville	A-1	1	12.2	90	10	0
Karschner, Paul, Benton, R. D.	A-1	2	12.5	92	8	0
Knouse, Fred, Benton	A-1	2.5	10.4	88	12	0
Miller, Robert, Catawissa, R. 3	A-1	1	12.5	88	12	0
Moser, Ralph L., Ringtown	A-1	7.25	13.36	86	14	0
Pfahler, Frank, Catawissa, R. 1	A-1	1	12.07	89	11	0
Reeder, Jos. T., Catawissa, R. 2	A-1	2	17.56	91	9	0
Seesholtz, Chas., Bloomsburg, R. D.	A-1	6	13.4	85	15	0
Seybert, L. M., Berwick	A-1	2	13.8	73	26	1
Shuman, Homer, Bloomsburg, R. 3	A-1	2	14.60	83	16	1

Welkon, Frank L., Catawissa, R. 2	A	1	11.73	78	22	0
Whitenight, B., Bloomsburg, R. 3	A	2	10.35	81	19	0
Whitenight, M., Bloomsburg, R. D.	A-1	6	13.37	89	10	1
Whitenight, R. E., Orangeville, R. 1	A	1	10.87	73	26	1
Young, Joseph, Bloomsburg, R. D.	A-1	1	10.3	88	12	0
CUMBERLAND COUNTY						
Bard, R. E., Shippensburg, R. 1	A-1	4	11.28	77	23	0
Berkheimer, Jacob M., Mechanicsburg, R. 2	A-1	4.5	13.18	80	20	0
Books, W. V., York Springs	A	2.5	10.55	84		
Books & Smith, Gardners	A	2.5	12.40	81		
Boyer, John, Mechanicsburg, R. 1	A	2	12.5	78	22	0
Brymesser, J. B., Carlisle, R. 6	A-1	3	11.42	80	19	1
Cumberland County Home, Carlisle, R. 1	A-1	4	11.55	82	18	0
Flohr, J. Paul, Carlisle, R. 6	A-1	2	10.5	86	14	0
McLauchlin, Kenneth, Shippensburg, R. 2	A-1	3	10.16	71	28	1
Marks, Gilbert, Gardners, R. 2	A	10	15.65	76		
Miller, J. L., Shippensburg	A-1	6	10.50	74	25	1

L. J. Wagner and his crew of producers and supervisors, inspecting the tomato crop produced according to the best practices recommended by the Agricultural Extension Service of Erie County and followed by previous ten-ton tomato growers of Pennsylvania.

Royer, W. H., Dillsburg, R. 1	A	3	10.0	76	23	1
Seibert, Robert & James, Shippensburg, R. 2	A-1	1	10.63	78	22	0
Strock, Weir, Mechanicsburg, R. 2	A-1	12	11.15	77	22	1
DELAWARE COUNTY						
Babb, Fred & Sons, Rosemont	A-1	7.5	10.01	68	29	3
ERIE COUNTY						
Ahlgrim, Fred, North East	A	2	12.80	60	40	0
Ahrens, Fred, North East	B-1	2	16.69			
Bemiss, A. C., North East	B-1	8	11.50	43	55	2
Bemiss, Smith L., North East	B-1	1	13.28			
Bensur, J. F., North Girard	A-1	1.5	14.46	89	10	1
Boyd, Robert C., North East	A-1	4	11.48	74	26	0
Engles, Fred, North East, R. D.	B-1	2	12.51			
Ferris, A. B., Harborcreek	A	2	15.54	76	24	0
Frey, Charles, North Girard	B	8	10.68	55	42	3
Frey, Chas., North Girard, R. 1	A	14	13.5	81	15	4
Frey, D. James, North Girard, R. 1	A	5	12.8	74	20	6
Garnow, Wm., North East	A-1	2	11.59	66	33	1
Goodwin, P. W., Martin Ave., North Girard	A	3	12.4	81	19	0
Griffen, V. L., North East	A-1	2	15.5	72	27	1
Grimshaw, Harry, North Girard	B	25	12.98	51	48	1
Hall, Jas. M., E. Springfield	A	9.5	10.2	84	15	1
Hammer, Ralph, Fairview, R. 1	B-1	4	11.49			
Hammer, Walter J., Harborcreek	B-1	4	10.44	50	48	2
Heidler, Ralph, Fairview	B	3	12.57	57	42	1
Herhold, W. C., Erie	A	6	10.97	65	35	0
Kach, Steve, Girard	B	8	15.06	46	50	4
Kebler, John, North East	B	1	13.71			
Kelly Farm (Wagner, L. J.) North East	B-1	11	10.34	53	46	1
Kendall, John, North East	A-1	2	12.40	79	21	0
Kibler, T. F., North Girard	B-1	6	14.17	54	45	1
Labowski, Walter, Harborcreek	B-1	3	12.83	56	43	1
Larson, Leo, North East	A-1	1.9	13.97	81	18	1
Lockwood, Wm., North Girard	A-1	4.75	10.85	67	32	1
Lord, H. C., North Girard, R. D.	B	8	15.99			
Nachman, John, E. Springfield	A-1	4	10.03	71	27	2
Page, Merle, & Son, North East	A-1	5	11.12	69	30	0
Paschke, D. C., North East	B-1	2	13.41	53	46	1
Phillips, A. D., North East	B	1	24.44	55	44	1
Pierce, Joseph, Harbor Creek	B	1	13.29			
Ripley, W. N., Harbor Creek, R. D.	B	5	11.63			
Roberts, Geo., Girard, R. 2	A-1	2	10.5	83	16	1
Shattuck, J. H., Erie	A-1	5	12.7	61	39	0
Short Farm (Wagner, L. J.) North East	A-1	7.7	23.30	74	23	3
Van Allsburg, J. E., North East	A-1	2	13.40	70	30	0
Weigel Brothers, Fairview	A-1	12	10.40	80	20	0
Worster, Geo., Harbor Creek, R. D.	B	2	11.49			
Yuhas, Andy, Girard	A-1	4	10.76	78	22	0

Welkon, Frank L., Catawissa, R. 2	A	1	11.73	78	22	0
Whitenight, B., Bloomsburg, R. 3	A	2	10.35	81	19	0
Whitenight, M., Bloomsburg, R. D.	A-1	6	13.37	89	10	1
Whitenight, R. E., Orangeville, R. 1	A	1	10.87	73	26	1
Young, Joseph, Bloomsburg, R. D.	A-1	1	10.3	88	12	0
CUMBERLAND COUNTY						
Bard, R. E., Shippensburg, R. 1	A-1	4	11.28	77	23	0
Berkheimer, Jacob M., Mechanicsburg, R. 2	A-1	4.5	13.18	80	20	0
Books, W. V., York Springs	A	2.5	10.55	84		
Books & Smith, Gardners	A	2.5	12.40	81		
Boyer, John, Mechanicsburg, R. 1	A	2	12.5	78	22	0
Brymesser, J. B., Carlisle, R. 6	A-1	3	11.42	80	19	1
Cumberland County Home, Carlisle, R. 1	A-1	4	11.55	82	18	0
Flohr, J. Paul, Carlisle, R. 6	A-1	2	10.5	86	14	0
McLauchlin, Kenneth, Shippensburg, R. 2	A-1	3	10.16	71	28	1
Marks, Gilbert, Gardners, R. 2	A	10	15.65	76		
Miller, J. L., Shippensburg	A-1	6	10.50	74	25	1

L. J. Wagner and his crew of producers and supervisors, inspecting the tomato crop produced according to the best practices recommended by the Agricultural Extension Service of Erie County and followed by previous ten-ton tomato growers of Pennsylvania.

Royer, W. H., Dillsburg, R. 1	A	3	10.0	76	23	1
Seibert, Robert & James, Shippensburg, R. 2	A-1	1	10.63	78	22	0
Strock, Weir, Mechanicsburg, R. 2	A-1	12	11.15	77	22	1
DELAWARE COUNTY						
Babb, Fred & Sons, Rosemont	A-1	7.5	10.01	68	29	3
ERIE COUNTY						
Ahlgrim, Fred, North East	A	2	12.80	60	40	0
Ahrens, Fred, North East	B-1	2	16.69			
Bemiss, A. C., North East	B-1	8	11.50	43	55	2
Bemiss, Smith L., North East	B-1	1	13.28			
Bensur, J. F., North Girard	A-1	1.5	14.46	89	10	1
Boyd, Robert C., North East	A-1	4	11.48	74	26	0
Engles, Fred, North East, R. D.	B-1	2	12.51			
Ferris, A. B., Harborcreek	A	2	15.54	76	24	0
Frey, Charles, North Girard	B	8	10.68	55	42	3
Frey, Chas., North Girard, R. 1	A	14	13.5	81	15	4
Frey, D. James, North Girard, R. 1	A	5	12.8	74	20	6
Garnow, Wm., North East	A-1	2	11.59	66	33	1
Goodwin, P. W., Martin Ave., North Girard	A	3	12.4	81	19	0
Griffen, V. L., North East	A-1	2	15.5	72	27	1
Grimshaw, Harry, North Girard	B	25	12.98	51	48	1
Hall, Jas. M., E. Springfield	A	9.5	10.2	84	15	1
Hammer, Ralph, Fairview, R. 1	B-1	4	11.49			
Hammer, Walter J., Harborcreek	B-1	4	10.44	50	48	2
Heidler, Ralph, Fairview	B	3	12.57	57	42	1
Herhold, W. C., Erie	A	6	10.97	65	35	0
Kach, Steve, Girard	B	8	15.06	46	50	4
Kebler, John, North East	B	1	13.71			
Kelly Farm (Wagner, L. J.) North East	B-1	11	10.34	53	46	1
Kendall, John, North East	A-1	2	12.40	79	21	0
Kibler, T. F., North Girard	B-1	6	14.17	54	45	1
Labowski, Walter, Harborcreek	B-1	3	12.83	56	43	1
Larson, Leo, North East	A-1	1.9	13.97	81	18	1
Lockwood, Wm., North Girard	A-1	4.75	10.85	67	32	1
Lord, H. C., North Girard, R. D.	B	8	15.99			
Nachman, John, E. Springfield	A-1	4	10.03	71	27	2
Page, Merle, & Son, North East	A-1	5	11.12	69	30	0
Paschke, D. C., North East	B-1	2	13.41	53	46	1
Phillips, A. D., North East	B	1	24.44	55	44	1
Pierce, Joseph, Harbor Creek	B	1	13.29			
Ripley, W. N., Harbor Creek, R. D.	B	5	11.63			
Roberts, Geo., Girard, R. 2	A-1	2	10.5	83	16	1
Shattuck, J. H., Erie	A-1	5	12.7	61	39	0
Short Farm (Wagner, L. J.) North East	A-1	7.7	23.30	74	23	3
Van Allsburg, J. E., North East	A-1	2	13.40	70	30	0
Weigel Brothers, Fairview	A-1	12	10.40	80	20	0
Worster, Geo., Harbor Creek, R. D.	B	2	11.49			
Yuhas, Andy, Girard	A-1	4	10.76	78	22	0

INTENTIONAL SECOND EXPOSURE

FRANKLIN COUNTY

Adams, Frank, Spring Run	A-1	4	10.0	68	30	2
Ausherman, H. A., Chambersburg, R. 1	A-1	3	10.36	74	26	0
Benedict, J. A., Waynesboro, R. 2	A-1	12	12.56	72	27	1
Coons, Bruce, Dry Run	A-1	5	10.35	76	24	0
Cramer, O. J., Chambersburg, R. 5	B	6	10.98	58	41	1
Eby, Ira L., Fayetteville, R. 1	A-1	3.75	10.60	73	26	1
Hawkins, S. C., Chambersburg, R. 1	A-1	3.5	10.35	65	33	2
Heckman, J., Chambersburg, R. 5	A	2.75	10.61	72	27	1
Henry, Wilbur, Chambersburg, R. 5	B	3	11.05	52	46	2
Karper, C. S., Shippensburg, R. 3	A-1	4	10.09	68	31	1
McClure, S. A., Dry Run	A-1	3.75	10.95	68	31	1
Musser, H., Chambersburg, R. 1	A-1	5	10.07	77	23	0
Piper, Jacob H., Dry Run	A-1	3.75	10.21	80	20	0
Spangler, H., Chambersburg, R. 5	A-1	5.5	10.09	66	33	1
Stouffer, A. A., Waynesboro, R. 1	A-1	5	10.61	65	34	1
Wenger, P. I., Shippensburg, R. 3	A-1	4.5	10.01	75	25	0
Widney, J. C., Dry Run	A-1	4	14.35	78	22	0
Witter, Roy E., Shippensburg, R. 3	A-1	4	11.77	74	24	0

HUNTINGDON COUNTY

Runk, Grover C., Broad Top	A-1	1.05	14.14	84	14	2
Starr, Chester, Three Springs	A-1	1.5	11.83	76	24	
Wright, Jasper H., Huntingdon Star Route	A-1	1.75	10.7	80	20	

JUNIATA COUNTY

Auker, J. L., Thompsontown, R. D.	A-1	1.5	12.93	70	30	
Barth, Frank, Mifflintown	A-1	1	14.14	69	31	
Frymoyer, N. B., Thompsontown, R. D.	A-1	1	11.32	71	29	
Graybill, Everett, McAlisterville	A-1	2	11.87	72	28	
Graybill, Wm. D., Thompsontown, R. D.	A	1	11.45	69	31	
Guyer, D. W., Thompsontown, R. D.	A	1	10.24	68	32	
Lauver, Harvey S., Mifflintown	A-1	1	10.10	67	33	
Sausman, John, Cocolamus	A-1	1	13.55	65	35	
Seiber, Joseph W., McAlisterville	A	1	14.36	70	30	
Swartz, Geo. W., McAlisterville	A-1	1.5	10.75	70	30	

Compliments of

SHIRLEY-AYR FARMS CANNERY

L. M. Hutchison, Owner

Mount Union, Pennsylvania

LANCASTER COUNTY

Adam, Alfons, Strasburg, R. 1	A-1	3	11.48	69	30	1
Ament, Paul R., Conestoga, R. 2	A	2	10.03	81	19	0
Baker, Lloyd, Millersville, R. 1	B-1	2	12.2			
Armstrong, R. C., Drumore, R. 1	B	3	10.8			
Bard, Ephraim G., Columbia, R. 1	A-1	2	16.87	76	23	1
Bare, Earl S., Leacock	A-1	2.5	12.65	74	25	1
Beiler, A. D., Bird-in-Hand, R. 1	A-1	3	10.16	67	31	2
Beiler, Ben B., Gordonville, R. 1	A-1	2	19.24	69	30	1
Beiler, Ben S., Paradise, R. 1	A-1	6	14.34	61	37	2
Beiler, E. R., Gordonville, R. 1	A-1	3	16.40	62	36	2
Beiler, John M., Ronks, R. 1	B-1	2.5	18.13	58	41	1
Beiler, Josiah M., Gap	A-1	2.5	11.0	88	12	0
Beiler, Leon, Narvon, R. 2	A-1	2	11.08	79	21	0
Beiler, Samuel U., Gap, R. 1	A-1	3.5	14.54	68	30	2
Beiler, Samuel Y,. Ronks, R. 1	A-1	2	11.22	69	30	1
Bernhard, Howard W., Florin	A	2	10.15	81	18	1
Blank, John S., Leola	A	2	14.67	67	32	1
Boll, David, Manheim, R. 2	A	2	10.43	71	28	1
Bolton, Leslie I., Holtwood	B-1	5	13.00			
Breneman, Jacob W., Willow Street, R. 1	B-1	4.25	13.48	51	47	2
Brenneman, A. R., Millersville, R. 1	A	2	11.98	85	15	0
Brenneman, Harry R., Washington Boro, R. 1	A	2	10.05	82	18	0
Brenneman, Mark, Manheim	A	3	10.61	86	14	0
Brown, A. E. & W. T., Nottingham	B-1	3	12.6			
Brubaker, Elam R., Mt. Joy, R. 1	A	2	10.48	84	16	0
Brubaker, Henry E., Mt. Joy, R. 1	A	4	12.03	72	27	1
Brubaker, Isaac M., Lititz, R. 2	A-1	6	10.0	80	19	1
Brubaker, Jacob G., Manheim, R. 1	A	7	10.46	78	20	2
Brubaker, Roy G., Manheim, R. 2	A-1	3	11.35	68	30	2
Brubaker, J. N., Lancaster, R. 2	A	2	11.40	88	12	0
Brubaker, Noah M., Lancaster, R. 1	A-1	3	11.18	76	24	0
Bruckhart, G., Manheim, R. 1	A	3	10.11	70	28	2
Bruckhart, John D., Manheim, R. 1	A	2.5	12.89	80	20	0
Bucker, Rufus, Quarryville	A-1	2.7	11.2	80	15	5
Burkey, Wilmer S., East Earl, R. 1	A-1	4	14.94	74	25	1
Burkholder, J., New Providence	A-1	2.9	13.0	73	25	2
Burkin, Andrew, Drumore, R. 1	B	4	10.1			
Burkholder, Anna M., New Holland, R. 1	A-1	3	12.68	71	27	2
Burkholder, John D., Lititz, R. 3	A-1	4.5	12.30	72	27	1
Burkholder, Titus K., Willow Street, R. 1	A-1	7	10.94	68	30	2
Burris, Ray, Marietta, R. 1	A	1	10.5	76	24	0
Cassel, Jeremiah, Manheim, R. 1	A	6	10.28	71	28	1
Charles, Amos B., Lancaster, R. 2	A	2	12.42	82	18	0
Charles, David H., Lancaster, R. 2	A	4	11.66	78	21	1
Clymer, John, Quarryville	A-1	3	13.5	77	21	2
Cutler, Joseph, Drumore	B-1	10	10.8			
Deemer, John M., 41 N. Charlotte St., Manheim	A-1	2	13.85	74	25	1
DeLong, Walter, Quarryville, R. 1	B-1	16	14.1			
Delp, Robert, Lititz, R. 1	A-1	2	10.06	80	20	0
Denlinger, C. H., Columbia, R. 2	A	5	11.70	76	24	0
Denlinger, Earl S., Paradise, R. 1	A-1	4	14.20	67	32	1
Denlinger, Paul B., Ronks, R. 1	A-1	6	13.96	71	27	2
Dourte, Monroe S., Manheim, R. 2	A	2.2	11.50	74	25	1
Drager, Walter, Columbia	A	4	10.52	64	36	0

Ebersol, LeRoy B., Bareville, R. 1	A-1	2	10.95	86	14	0
Eby, Menno, Gap, R. 1	B	5	10.03	50	46	4
Eckman, Park, Lancaster, R. 6	B-1	2.6	11.3			
Eichelberger, Jacob, Manheim, R. 1	A	3	10.38	71	29	0
Enders, J. Harry, Lancaster, R. 1	A-1	3	14.15	74	26	0
Erb, James M., Pequea, R. 1	A-1	3	10.83	75	24	1
Erb, Roy B., Lancaster, R. 3	A-1	3	12.0	61	38	1
Esbenshade, A., New Holland, R. 2	A-1	6	17.98	78	21	1
Esbenshade, Jacob E., New Holland, R. 2	A-1	4	12.84	76	23	1
Esbenshade, R., New Holland, R. 2	A-1	12	12.63	74	25	1
Esch, Samuel M., Ronks, R. 1	A-1	2.25	15.01	74	24	2
Eshleman, Howard M., Willow Street, R. D.	A-1	4	13.16	69	30	1
Eshleman, J. Daniel, Manheim, R. 2	A-1	4	10.39	68	31	1
Eshleman, John F., Lancaster, R. 6	A-1	3	11.34	63	35	2
Fisher, Amos H., Ronks, R. 1	A-1	3	14.59	60	38	2
Fisher, Benjamin B., Ronks, R. 1	B-1	3	10.08	56	42	2
Fisher, Christ E., Paradise, R. 1	B-1	3	12.59	57	41	2
Fisher, Dewese, Elverson, R. 2	B-1	2	11.97			
Fisher, Elam S., Gordonville, R. 1	A-1	4	11.18	71	28	1
Fisher, John K., Kinzer, R. 1	A-1	3	13.64	64	35	1
Fisher, Noah H., Ronks, R. 1	A-1	3	14.64	64	33	3
Forrey, Chas., Elizabethtown, R. 1	A	3	10.29	76	23	1
Forry, Benjamin, Manheim, R. 2	A	3.6	18.20	79	21	0
Forry, Daniel G., Mt. Joy, R. 1	A	2	10.23	67	31	2
Forry, Irvin, Manheim, R. 2	A	2	12.34	80	20	0
Forry, Rudy G., Manheim, R. 2	A	3	10.31	83	16	1
Frank, H. B., Quarryville	B	2	13.0			
Frank, I. W., Elizabethtown, R. 1	A	4	11.74	71	19	0
Frankhouser, Jacob R., Goodville	A-1	4	11.09	67	32	1
Frey, Armor P., Conestoga, R. 2	A-1	18	14.80	85	15	0
Frey Brothers, Conestoga, R. 2	A	3	12.09	72	26	2
Frey, H. K., Lancaster, R. 6	B-1	5	10.3			
Frey, H. T., Elizabethtown, R. 3	A	2	10.12	88	12	0
Frey, J. Mowery, Lancaster, R. 4	A-1	3	11.97	62	36	2
Fritz, A. H. & C. W., Quarryville	A-1	2	11.0	64	34	2
Fritz, John I., Lancaster, R. 5	A-1	3.25	12.79	75	24	1
Funk, Mildred M., Washington Boro, R. 1	A	7	10.71	80	20	0
Garber, B. Snavely (H. H. Snavely)						
Garber, Jay C., Lancaster, R. 6	A-1	5.5	12.88	66	33	1
Gantz, Wm. W., Lancaster, R. 2	A	2	10.36	85	15	0
Gehman, Allen, Ronks, R. 1	A-1	4	13.30	61	37	2
Getz, Rohrer, Mt. Joy, R. 1	A-1	8	12.65	75	25	0
Gibble, Graybill G., Manheim, R. 1	A-1	4.5	10.80	84	16	0
Gingrich, Wm. H., Elizabethtown, R. 3	A	1	10.39	85	14	1
Glick, Abner, Gap, R. 1	B-1	2	11.65			
Glick, Adam B., Millersville, R. 1	A	3	12.70	77	23	0
Glick, Robt. B., Millersville, R. 1	A	2	12.72	84	16	0
Glick, Samuel Roy, Narvon, R. 1	A-1	4	15.89	73	26	1
Gochenaur, Robert H., Willow Street, R. 1	A-1	2.5	10.38	76	23	1
Good, Elmer V., Lititz, R. 1	A-1	1.7	17.21	75	24	1
Good, Harry M., East Earl, R. 1	B-1	3	12.93			
Good, Ira M., Bainbridge, R. 1	A	2	10.55	80	20	0
Greider, Benjamin L., Mt. Joy, R. 1	B-1	2	14.9			
Groff, Amos M., Lancaster, R. 2	A-1	4	13.10	61	38	1
Groff, Clarence, Kinzer	B-1	3	12.66			

Groff, Earl L., Strasburg, R. 1	A-1	3	16.13	68	30	2
Groff, Elias H., Lancaster, R. 6	A-1	7	12.33	65	33	2
Groff, Joseph M., Christiana, R. 1	A-1	3	11.1	73	26	1
Groff, Landis S., Strasburg, R. 1	A-1	5	13.76	64	34	2
Habecker, Chas. C., Lancaster, R. 2	A	3.5	10.49	83	16	1
Harnish, A. Huber, Conestoga, R. 2	A-1	10	11.01	66	32	2
Harnish, Christ C., Willow Street, R. 1	A-1	3	10.19	63	36	1
Harnish, C. H., Lancaster, R. 4	A-1	5	11.97	64	35	1
Harnish, Clayton C., Willow Street, R. 1	A-1	3	10.10	73	26	1
Harnish, J. Lloyd, Lancaster, R. 6	A-1	10	11.26	60	38	2
Hartenstine, Chas. R., Lititz, R. 3	A-1	2.25	11.02	70	29	1
Heiney, Samuel C., Pequea, R. 1	A-1	2	10.57	74	25	1
Heisey, Calvin, Millersville	B-1	2.9	13.2			
Heisey, Elam W., Columbia, R. 2	A	3	14.09	78	22	0
Heisey, Leroy R., Mt. Joy, R. 1	A	3	15.31	74	25	1
Heisey, Paul, Millersville	B-1	2.4	10.5			
Herr, Clarence B., Lancaster, R. 4	B-1	4	10.78	59	40	1
Herr, David S., Lancaster, R. 2	A	5	10.77	70	30	0
Herr, Emma F., Holtwood, R. 2	A-1	3	13.09	62	37	1
Herr, F. S., Washington Boro, R. 1	B-1	4.5	11.0			
Herr, H. E., Willow Street, R. 1	A-1	8	10.64	64	35	1
Herr, Henry, Lancaster, R. 6	B-1	3	14.0			
Herr, I. H., Lancaster, R. 6	A	5	11.37	79	21	0
Herr, Ira L., Willow Street, R. 1	A-1	8	13.10	74	25	1
Herr, Ivan B., New Holland, R. 2	A-1	4	12.44	79	21	0
Herr, John H., Lancaster, R. 2	B-1	3.5	10.2			
Herr, John H., Jr., Holtwood, R. 2	A	6.5	12.48	68	30	2
Herr, John R., Millersville, R. 1	A	3	10.29	92	8	0
Herr, R. G., Millersville	B-1	3	11.1			
Herr, Richard, Lancaster, R. 6	B-1	3	14.0			
Hershey, I. Leaman, Gap, R. 1	A-1	3	10.88	60	38	2
Hershey, Milton L., Manheim, R. 3	A-1	6	10.58	76	23	1
Hershey, Walter H., Lancaster, R. 6	A	3	11.29	85	15	0
Hess, Charles H., Pequea, R. 1	A-1	3	15.84	68	31	1
Hess, Christ G., Lititz, R. 3	A	3	10.02	78	21	1
Hess, D. A., Washington Boro, R. 1	A	3	10.97	78	21	1
Hess, David L., Mt. Joy, R. 1	A-1	7	10.63	68	30	2
Hess, David L., Jr., Mt. Joy, R. 1	A-1	7.5	13.38	68	30	2
Hess, H. M., Mt. Joy, R. 1	A	5	11.96	71	28	1
Hess, Henry R., Willow Street, R. 1	A-1	6	13.51	68	30	2
Hess, Jacob, Willow Street, R. 1	B-1	2	10.1			
Hess, Jacob G., Lancaster, R. 6	A-1	4	10.52	71	28	1
Hess, James H., Willow Street, R. 1	A-1	6	12.67	66	33	1
Hess, Maris W., Conestoga, R. 1	B-1	3.25	11.81	58	40	2
Hess, Melvin, Lancaster, R. 3	A	1.7	11.51	65	34	1
Hess, Paul A., Willow Street, R. 1	A-1	6	14.10	63	36	1
Hiestand, C. J., Jr., Bainbridge, R. 1	A	4	11.31	74	25	1
High, Mahlon H., Lancaster, R. 4	B-1	4	13.5			
High, Levi G., New Holland, R. 2	A	1.7	14.90	79	20	1
Hoffman, Michael R., Maytown	A-1	7.2	10.09	69	29	2
Hoffman, Roy, Mt. Joy	A	3	12.66	76	23	1
Holbein, Walter B., Lancaster, R. 1	A-1	1.5	10.76	71	27	2
Hollinger, Noah, Goodville	A-1	4	20.30	72	27	1
Hoover, Emanuel, Kinzer	B-1	1.88	11			
Hoover, F. B., New Holland, R. 1	A-1	4	10.08	74	25	1
Hoover, Harry O., Bareville, R. 1	A-1	2	16.77	80	19	1
Horst, Harry S., East Earl, Box 4	A	6	13.80	76	23	1
Horst, Jacob G., East Earl, R. 1	B	2	15.53			

Hostetter, H. M., Lancaster, R. 2	A-1	7	11.48	70	29	1
Houck, Christian W., Paradise, R. 1	A-1	3	16.12	61	38	1
Houser, Elizabeth H., Lancaster, R. 4	A-1	4	10.23	74	25	1
Huber, Ross N., Lancaster, R. 4	A-1	3	16.90	73	27	0
Humbert, Elmer, Columbia, R. 2	A	8	10.01	66	33	1
Ibach, Burnell, Lititz, R. 4	A	1.5	13.05	74	25	1
Jackson, L., Peach Bottom, R. 2	B-1	4.6	11.9			
Jacobs, Wm. B., Narvon, R. 2	B	3	11.32			
Kauffman, John G., Columbia, R. 2	A	2	13.18	79	21	0
Kaylor, Roy, Elizabethtown, R. 3	A	3	10.95	76	22	2
Keck, George, Columbia, R. 2	A	2	13.86	80	20	0
Keene, Victor A., Quarryville, R. 3	A-1	5	13.3	82	17	1
Keener, Allen G., Sheridan, R. 1	A	2	12.22	72	27	1
Keller, A. Rohrer, Lititz, R. 2	A-1	6.5	11.94	77	23	0
Kilheffer, A. K., Lancaster, R. 2	B-1	2	10.1			
King, Daniel B., Gap, R. 1	A-1	6	16.99	81	18	1
King, Samuel B., Ronks, R. 1	A-1	3	17.02	64	35	1
King, Samuel B., Honey Brook, Star Route	A	2.5	11.69	74	25	1
Kinzer, William, Paradise	B-1	8	11.0			
Klaus, E. E., Willow Street, R. 1	A-1	4	12.66	63	36	1
Kline, E. Samuel, Lititz, R. 1	A-1	5.5	11.29	84	16	0
Kniesly, Abram, Lancaster, R. 1	A	2	12.22	74	24	2
Kreider, Clayton, Quarryville, R. 1	B	5	13.8			
Kreider, J. Lloyd, Strasburg, R. 1	B-1	4.5	11.02	48	49	3
Kreider, John, Quarryville, R. 1	B	5.5	10.3			
Kreider, Lloyd H., E. Petersburg	A	4	10.02	68	30	2
Kreider, Mahlon H., Lancaster, R. 3	A-1	3.5	10.58	73	26	1
Landis, Christian L., Ronks, R. 1	A-1	3	18.33	69	29	2
Landis, Eli, Jr., Christiana, R. 1	A-1	2.5	10.2	91	9	0
Landis, Elvin M., Lancaster, R. 5	A-1	4	11.35	73	26	1
Landis, Ira D., Lititz, R. 3	A	4	12.14	75	24	1
Landis, John E., Lancaster, R. 5	A-1	3	12.76	75	24	1
Landis, Norman, Quarryville, R. D.	B	3	12.0			
Lapp, Amos A., Lancaster, R. 4	A	3	14.74	63	37	0
Lapp, C. G., Lancaster, R. 5	B-1	4.5	10.8			
Lapp, Daniel S., Strasburg, R. 1	A-1	2.5	13.93	71	28	1
Lapp, John S., Ronks, R. 1	B-1	3	11.01	59	40	1
Lapp, Moses, Gap, R. 1	B-1	3	12.68			
Lapp, Samuel, Jr., Gap, R. 1	A-1	3.5	10.41	63	35	2
Leaman, Clayton D., Narvon, R. 2	A-1	3	12.15	78	21	1
Leaman, Paul R., Lancaster, R. 5	A-1	3	15.18	73	26	1
Leaman, Ross G., Ronks, R. 1	B-1	3	11.10	59	40	1
Leaman, Tobias G., Lancaster, R. 4	A-1	3.5	11.55	69	29	2
Lefever, Harold, Quarryville, R. 1	A-1	4	11.1	66	33	1
Lefever, Isaac H., Lancaster, R. 3	A-1	3	10.13	70	28	2
Lefever, Victor M., Bird-in-Hand	A-1	7	11.07	67	32	1
Lehman, Milton H., Conestoga, R. 2	A	2	11.82	79	21	0
Lenox, D. L., Washington Boro, R. 1	A-1	4	13.85	71	28	1
Leonard & Wesley, Holtwood, R. 2	B	3	10.6			
Lichty, Harry R., East Earl, R. 1	A-1	5	15.46	78	21	1
Long, James & C. H., Drumore, R. 1	B	3	13.8			
Longnecker, A. B., Elizabethtown, R. 1	A	4	10.15	80	20	0
Longenecker, E. B., Manheim, R. 1	A-1	5.5	10.27	61	38	1
Longenecker, P. G., Strasburg, R. 1	B-1	5	14.34	59	39	2
Longnecker, P. B., Elizabethtown, R. 1	A	4	10.15	80	20	0

Lyons, Arvil, & Brown, A. E., Nottingham, R. 2	B-1	2	13.6			
McCrabb, Chas., Quarryville, R. 2	A-1	2	11.2	70	28	2
McCrabb, Frank, Quarryville, R. 2	A-1	2.25	14.8	75	25	0
McMinn, Walter C., Jr., Lancaster, Box 509	B-1	4	10.51	56	42	2
McNiss. Mrs. and Mrs. Stewart, Kirkwood, R. 1	A-1	2	11.2	67	32	1
Mann, Ira C., Mt. Joy, R. 1	A	2	10.07	78	22	0
Martin, C. W., Bird-in-Hand, R. 1	A-1	3	15.58	75	25	0
Martin, Clayton M., East Earl, R. 1	A-1	3	18.32	74	25	1
Martin, Earl F., Bird-in-Hand, R. 1	A	2	15.37	71	28	1
Martin, Elam K., Narvon, R. 1	A-1	3	10.26	73	26	1
Martin, Eli W., New Holland, R. 1	A-1	3	10.66	70	28	2
Martin, Eli Z., Churchtown	B	2.5	13.22			
Martin, Guy W., East Earl, R. 1	B-1	3.5	13.07			
Martin, Henry M., Narvon, R. 2	A-1	3.5	11.24	64	35	1
Martin, Isaac C., East Earl, R. 1	B	2	12.49			
Martin, Isaac N., New Holland, R. 1	A-1	2.5	11.13	70	29	1
Martin, J., New Holland, R. 1	A-1	4	12.72	62	36	2
Martin, J. L., Kinzer, R. 1	B	6	17.60			
Martin, Lester C., East Earl, R. 1	A	9	15.40	75	24	1
Martin, Moses M., East Earl, R. 1	B-1	3	10.34	51	47	2
Martin, Noah K., New Holland, R. 1	A-1	2	15.97	77	22	1
Martin, Weaver, New Holland, (Jackson St.)	A-1	3	10.22	79	19	2
Martin, Weaver H. S., New Holland, R. 1, Box 177	A-1	3	11.16	83	17	0
Mast, Ethan A., Narvon, R. 2	A-1	5	12.09	75	25	0
Melhorn, John, Mt. Joy	A	3	14.84	78	21	1
Miller, Andrew N., Manheim, R. 2	A	2	10.06	69	39	1
Miller, Claude D., Conestoga, R. 1	A-1	3.5	12.12	66	32	2
Miller, John, Strasburg	A-1	5	17.36	67	31	2
Miller, Mervin, Bainbridge	A	3	10.13	70	28	2
Mowery, L., Willow Street, R. 1	A-1	5	15.02	79	21	0
Musser, A. K., Columbia, R. 2	A	2	13.03	92	8	0
Musser, Elias Z., Mt. Joy, R. 1	A	4	11.67	72	27	1
Myer, Aldus N., Lititz, R. 3	A-1	6	10.60	69	29	2
Myer, Clayton P., Manheim, R. 2	A	4	13.18	81	19	0
Myer, Nettie M., Bird-in-Hand, R. 1	A-1	5	11.55	66	33	1
Myers, John J., Lancaster, R. 3	A-1	2	10.07	78	21	1
Myers, Linton D., Bareville, R. 1	A-1	5	12.24	66	33	1
Mylin, C. K., Willow Street, R. 1	A-1	9	12.83	68	31	1
Mylin, N. R., Willow Street, R. 1	B-1	2	11.0			
Nafziger, Ira, Columbia, R. 1	A-1	5	10.45	70	29	1
Nauman, N. W., Manheim, R. 3	A-1	11.5	11.36	71	28	1
Neff, Cyrus L., Lancaster, R. 2	A	2	13.55	66	33	1
Neff, Roy, Millersville	B-1	2.25	13.2			
Newswanger, A. B., Narvon, R. 1	B	2	13.24			
Newswanger, Paul S., New Holland, R. 1	A-1	2.25	15.03	75	24	1
Nissley, Raymond, Bainbridge	A	3	11.90	78	22	0
Peters, Wayne R., Manheim, R. 2	A	3	13.70	82	17	1
Petersheim, Barbara, Elverson, R. 2	A-1	6.75	12.78	70	28	2
Pollock, Wilbur, Holtwood, R. D.	B	3	14.9			
Pownall, Harry, Quarryville, R. 2	B	3	12.3			
Ranck, Elvin D., Quarryville, R. 3	A-1	4	11.4	62	37	1
Ranck, Mrs. Esther A., Washington Boro, R. 1	A	2	11.25	90	10	0
Ranck, Wenger, Lancaster, R. 4	A-1	3	11.12	65	33	2

Rank, Ira S., Lancaster, R. 3	A-1	2	12.14	92	8	0
Reeser, N. K., Bird-in-Hand, R. 1	A-1	4	13.46	74	25	1
Reinhold, C. H., East Petersburg	A-1	4	11.09	73	25	2
Reynolds, J. W., Willow Street, R. 1	A-1	2	14.50	64	35	1
Riehl, Jesse B., New Holland, R. 2	A-1	3	15.11	71	27	2
Ringler, Floyd, Churchtown, R. 1	B	3	10.22			
Risser, Abram M., Manheim, R. 2	A-1	1.24	20.16	73	26	1
Rohrer, Elvin M., Lancaster, R. 5	A-1	3	13.31	80	20	0
Rohrer, B. Frank, Columbia, R. 1	A	3	13.10	87	13	0
Rohrer, J. Norman, Manheim, R. 2	A-1	4	13.14	79	20	1
Rohrer, Wilmer D., Lancaster, R. 5	A-1	3	11.82	80	20	0
Roland, Elmer, Elizabethtown, R. 1	A	5	10.91	76	24	0
Rutt, Clarence, 133 Prince St., Millersville	A	1	13.54	77	23	0
Rutt, Norman, Elizabethtown, R. 1	A	7	10.17	70	30	0
Sangrey, J. Clayton, Lititz, R. 2	A	3	10.47	78	20	2
Sauder, Amos H., Ephrata, R. 2	A-1	4	11.04	74	25	1
Sauder, Levi, Narvon, R. 1	B	2	11.45			
Schneider, Naomi C., New Providence, R. 1	B	2	15.0			
Schock, John M., Washington Boro, R. 1	B-1	5	11.40			
Seigrist, J. Henry, Manheim, R. 1	A-1	2.8	10.26	79	20	1
Sensenich, Abram, Lititz, R. 3	A	5.5	10.69	59	38	3
Sensenig, Aaron Z., East Earl, R. 1	B	3	14.17			
Sensenig, E. M., New Holland, R. 1	A-1	2.5	13.10	70	29	1
Sensenig, Harry, Lancaster, R. 2	A	2	10.33	80	20	0
Shaffer, Elmer H., Manheim	A-1	1.5	10.00	81	18	1
Shank, Walter L., Lancaster, R. 6	A-1	5	11.49	64	34	2
Sheaffer, Abram R., Lancaster, R. 2	A-1	6	10.39	70	29	1
Shearer, Elmer, Mt. Joy, R. 1	A	2	10.74	76	21	3
Shellenberger, D. L., Columbia, R. 2	A-1	3	11.06	73	26	1
Shenk, Clayton H., Lancaster, R. 6	A-1	3	10.68	62	35	3
Shenk, H. Martin, Manheim, R. 1	A-1	5	10.81	72	27	1
Shenk, John S., Lancaster, R. 6	A-1	15	10.86	60	38	2
Sherer, Elam, Manheim, R. 2	A	2	11.48	75	24	1
Sherer, Simon, Mt. Joy, R. 2	A	2	10.93	77	22	1
Shertzer, Aaron N., Lancaster, R. 2	B	3	10.78	82	18	0
Shertzer, L. M., Lancaster, R. 2	A-1	5	10.23	72	27	1
Shirk, Amos M., Columbia, R. 2	A	3	11.63	71	28	0
Shirk, Samuel R., Narvon, R. 1	B	1.5	15.73			
Shirk, Weaver W., East Earl, R. 1	A-1	3	12.36	72	26	2
Shultz, Clair H., Holtwood, R. 2	B	4	12.2			
Siegrest, Jason B., Lancaster, R. 6	A-1	4	10.72	65	34	1
Siegrest, N. H., Columbia, R. 1	A-1	5	11.39	71	28	1
Sigman, Daniel M., Mt. Joy, R. 1	B-1	3	11.30			
Smith, Mrs. Ada Mae, Mountville	A	2.4	10.50	77	23	0
Smucker, Amos B., East Earl, R. 1	A-1	3	12.27	64	35	1
Smucker, S. M., New Holland, R. 2	A-1	4.5	12.18	69	28	3
Snader, D. E., Jr., Narvon, R. 2	B	1.5	10.63			
Snavely, H. H., Willow Street, R. 1	A-1	7	11.62	65	34	1
Snyder, John B., Columbia, R. 1	A	2	12.51	90	10	0
Sprout, J. Lamar, Christiana, R. 1	A-1	3	10.70	76	23	1
Stirling, R. F., Manheim, R. 2	A	3	10.20	73	27	0
Stoltzfus, Amos E., Elverson, R. 2	A-1	3	11.52	69	29	2
Stoltzfus, Amos U., Ronks, R. 1	A-1	2	16.47	67	32	1
Stoltzfus, Benj. E., Elverson, R. 2	A	3	15.01	80	20	0
Stoltzfus, Benj. F., Elverson, R. 2	A-1	3	13.83	71	28	1
Stoltzfus, Chester Z., Talmage	A-1	3	12.27	66	31	3
Stoltzfus, Daniel M., Narvon, R. 1	A-1	3	11.94	73	25	2

Stoltzfus, Elam S., Gap, R. 1	A-1	3.5	11.79	75	24	1
Stoltzfus, Emanuel, Elverson, R. 2	B	2	19.46			
Stoltzfus, Fred K., Elverson, R. 2	A-1	18	11.19	73	26	1
Stoltzfus, John E., Narvon, R. 1	A	3	12.88	79	20	1
Stoltzfus, John F., Elverson, R. 2	A-1	4.6	24.4	75	24	1
Stoltzfus, Leroy K., Elverson, R. 2						
Stoltzfus, Levi E., Narvon, R. 1	B-1	4	12.88	53	44	3
Stoltzfus, S. L., Gordonville, Box 3	A-1	4	12.70	65	34	1
Stoltzfus, S. E., Elverson, R. 2	A-1	3	13.42	63	34	3
Stoltzfus, S. F., Gordonville, R. 1	A-1	3	12.97	64	35	1
Stoner, Alvin P., & Clarence B. Stoner, Ephrata, R. 2	A-1	2.5	11.06	77	21	2
Stoner, John L., Lancaster, R. 4	A-1	3	11.54	77	23	0
Summers & Mimm, Quarryville, R. 3	A-1	3	14.4	65	34	1
Swarey, Menno D., Kinzer, R. 1	A-1	3.5	14.86	63	35	2
Sweigart, D. Wayne, Mt. Joy, R. 1	A	2	10.20	74	25	1
Sweitzer, Clayton A., Marietta, R. 1	A-1	3	10.39	71	28	1
Thomas, Clayton M., Lancaster, R. 6	A-1	2	14.03	70	28	2
Toews, Jacob, Manheim, R. 1	A-1	3	10.68	72	27	1
Tollinger, R., Peach Bottom, R. 2	B-1	3	12.6			
Troop, Hiram G., Quarryville	A-1	3	16.0	79	21	0
Wagoner & Furches, Quarryville, R. 2	A-1	4	10.6	80	20	0
Walk, Earl, Conestoga, R. 2	A	3	10.75	83	17	0
Warfel, B. S., Drumore	B	23	10.2			
Wrafel, Lester, Drumore	B	2.5	13.1			
Weaver, Ammon M., East Earl, R. 1	B	2	15.91			
Weaver, Elmer P., E. Orange & Cottage Ave., Lancaster	A	4	11.50	68	31	1
Weaver, H., Peach Bottom, R. 2	B-1	4	17.1			
Weaver, Joseph O., Narvon, R. 1	B	2	17.83			
Weaver, Levi M., Lancaster, R. 3	A	8	10.42	67	31	2
Weidman, Amos, Columbia, R. 2	A	3	12.68	83	17	0
Wenger, Frank, Lancaster, R. 4	A-1	3	12.14	60	39	1
Wenger, John M., Ephrata, R. 2	A-1	6	10.83	63	36	1
Wenger, Norman F., Manheim, R. 2	A	6	14.51	76	24	0
Wiggins, R. J., Holtwood, R. 1	A-1	3	12.8	79	20	1
Williams, Harry, Bainbridge, R. 1	A	2	10.85	79	21	0
Wilson, Earl F., Lancaster, R. 6	A-1	4	12.54	67	32	1
Winters, E. Oliver, Columbia, R. 2	A-1	8	10.25	66	32	2
Witmer, Elmer R., East Earl, R. 1	A	6	12.80	69	30	1
Witmer, Elam W., Ephrata, R. 2	A-1	4	12.08	65	34	1
Witmer, Jonas, Millersville, R. 1	B-1	3	13.1			
Witmer & Hess, Mt. Joy, R. 1	A	3	10.15	77	23	0
Witwer, George R., Narvon, R. 2	A-1	2	10.02	80	19	1
Witwer, W. S., Gordonville, R. 1	B-1	3	16.07	58	40	2
Wolgemuth, C. M., Mt. Joy, R. 1	A	2	13.02	79	20	1
Wolgemuth, Jos. M., Mt. Joy, R. 1	A	6	12.01	71	28	1
Yelk, Henry, Narvon, R. 1	B	3	16.70			
Zimmerman, E. M., East Earl	B-1	4	11.30			
Zimmerman, M. M., Manheim, R. 3	A	7	11.44	75	23	2
Zook, Amos K., Gordonville, R.1	B-1	5	13.40	59	38	3
Zook, Jacob K., Gap, R. 1	A-1	2	10.29	72	26	2

LEBANON COUNTY

Arnold, Elijah H., Lebanon, R. 5	A-1	3.25	11.30	74	26	0
Balmer, Abram G., Myerstown, R. 2	A-1	3.25	11.73	67	32	1
Balmer, Harry W., Manheim, R. 2	A-1	3	12.1	73	27	0
Balsbaugh, Amos J., Lebanon, R. 1	A-1	4	13.59	73	26	1

Balsbaugh, P. A., Myerstown, R. 2	A-1	4	12.10	73	25	2
Batdorf, Adam, Lebanon, R. 5	A-1	2	10.32	78	22	0
Bollinger, H. G., Sheridan, R. 1	A-1	3	11.01	74	24	2
Bollinger, I. E., Myerstown, R. 2	A-1	4	10.62	81	18	1
Bomberger, John S., Lebanon, R. 1	A-1	4	14.46	77	23	0
Bowman, J. O., Myerstown, R. 2	A-1	4	10.52	82	18	0
Brubaker, A. A., Myerstown, R. 2	A-1	3	10.12	85	15	0
Bucher, Miles K., Lebanon, R. 1	A-1	6.5	14.55	77	23	0
Burkholder, R. M., Myerstown, R. 2	A-1	3	17.43	65	33	2
Dubble, John R., Lebanon, R. 1	A-1	2	13.93	73	26	1
Dubble, W. G., Myerstown, R. 2	A-1	3	11.67	66	33	1
Fry, Harry H., Lebanon, R. 1	A	8	12.79	75	24	1
Gibble, John H., Myerstown, R. 2	A-1	11.5	12.79	74	25	1
Gingrich, Herman A., Lebanon, R. 5	A-1	3	12.58	76	23	1
Grumbine, Lee J., Myerstown, R. 2	A-1	11	11.56	71	28	1
Harnish, Christ B., Myerstown, R. 2	A-1	2.5	11.43	72	26	2
Heisey, Mark W., Lebanon, R. 5	A-1	5	10.90	74	24	2
Hertzler, Daniel R., Richland, R. 1	A-1	3.5	14.32	77	23	0
Hiester, Chas., Straustown	A-1	3	13.6	82	18	0
Hitz, Landis G., Lebanon, R. 1	A-1	5	16.31	73	26	1
Hoover, Joseph O., Myerstown, R. 2	A-1	3	10.41	70	30	0
Horning, David H., Myerstown, R. 2	A-1	5	10.12	77	22	1
Horst, Allen G., Sheridan, R. 1	A-1	3	11.36	81	19	0
Horst, Ammon G., & David B. Kurtz, Myerstown, R. 2	A-1	2.5	13.30	76	23	1
Kline, Ida, Myerstown, R. 2	A-1	5.5	10.14	74	25	1
Knauer, Geo. G., Sheridan, R. 1	A-1	3	11.08	77	23	0
Knauer, Harry G., Sheridan, R. 1	A-1	8	13.13	79	21	0
Krall, Warren A., Myerstown, R. 2	A-1	3	13.30	79	20	1
Kupp, Landis, Lebanon, R. 1	A-1	3	11.08	73	26	1
Kurtz, H. F., Womelsdorf, R. 1	A-1	4	10.39	80	20	0
Lehman, Jesse, Myerstown, R. 1	A-1	3	12.65	68	31	1
Martin, Ezra S., Lebanon, R. 2	A-1	6	13.20	73	26	1
Moyer, Wm. H., Schaefferstown	A-1	5.5	11.15	75	23	2
Nolt, Christian, Richland, R. 1	A-1	3	10.26	71	28	1
Nolt, Phares S., Lebanon, R. 1	A-1	4	12.66	73	25	2
Phillipy, Rufus, Sheridan, R. 1	A-1	3	11.26	70	25	5
Sanger, P. E., Myerstown, R. 2	A-1	5.25	12.81	65	32	3
Smith, Ray W., Lebanon, R. 5	A-1	9	15.11	70	28	2
Snyder, Robert J., Lebanon, R. 1	A-1	3	16.80	81	18	1
Sonnen, Glenn A., Richland, R. 1	A-1	3	16.93	68	31	1
Stoltzfus, E. G., Myerstown, R. 2	A-1	3	11.25	75	24	1
Weaver, Ivan G., Lebanon, R. 5	A-1	3	12.98	75	24	1
Weik, E. H., Kleinfeltersville	A-1	2.5	11.78	76	23	1
Wenger, Allen W., Lebanon, R. 1	A-1	3	10.77	70	29	1
Wenger, Edwin G., Richland, R. 1	A-1	3	11.48	74	25	1
White, Caleb H., Lebanon, R. 1	A-1	3.5	10.43	73	26	1
Ziegler, Abraham H., Richland	A-1	5	12.78	79	21	0
Zuck, Norman E., Lebanon, R. 5	A-1	1.25	12.59	82	17	1
LEHIGH COUNTY						
Keck, Harold M., Bethlehem, R. 4	A-1	14	12.24	60	36	4
Moyer, E. H., & Edwin O. S. Moyer, Center Valley, Box 182	A-1	15	13.23	70	28	2
Weaver, Arthur C., Limeport	A-1	3.5	13.83	76	24	0
Wertman, C. L., Coopersburg, R. 2	A-1	4	12.64	77	22	1

LUZERNE COUNTY						
Chapin, Fred R., Wapwallopen	A	2	11.56	64	34	0
Chapin, Russell, Wapwallopen	A-1	2	10.9	84	15	1
Eckrote, Oscar K., Conyngham	A-1	1.75	10.88	83	17	0
Eroh, Roy, Nescopeck	A-1	1	10.0	88	12	0
Hilliard, Archie, Sugarloaf	A-1	2	12.5	84	16	0
Kauffman, Carl W., Drums	A-1	2.75	10.53	76	24	0
Kauffman, George E., Sugarloaf	A-1	2	11.03	64	35	1
Sitler, David, Nescopeck, R. D.	A-1	4	10.6	86	14	0
Slusser, Floyd P., Nescopeck, R. 1	A	1	12.04	90	10	0
Smith Brothers, Nescopeck, R. 1	A-1	4	11.37	84	16	0
Thomas, Ralph, Drums	A-1	3	10.34	81	19	0
Wright, Carl, Nescopeck	A-1	3	11.4	82	18	0
Zehner, Claude, Bloomsburg, R. 3	A-1	1.75	10.94	74	25	1
LYCOMING COUNTY						
Bitler, Max S., Muncy, R. 1	A-1	4	11.58	83	17	0
Eichenlaub, Harry W., Muncy, R. 4	A	5	10.65	84	16	0
Hagenbuch, Paul M., Montgomery, R. 2	A-1	3.9	12.32	75	25	0
Houseknecht, J. R., Muncy, R. 1	A-1	3	11.32	84	16	0
Jarrett, Emery, Linden, R. D.	A	4	10.47	76	24	0
Luckenbill, E., Allenwood, R. 2	A	1.7	10.37	92	8	0
Meckley, James M., Muncy, R. 1	A-1	3	10.66	86	12	2
Schmidt, Dietrich, Muncy, R. 3	A-1	2	10.61	90	10	0
Shipman, B. L., Muncy, R. 4	A	4	12.55	83	17	0
Shipman, Clinton, Muncy, R. 1	A-1	4	15.95	88	12	0
Snyder, Kenneth, Muncy, R. 1	A-1	3	15.47	86	14	0
MIFFLIN COUNTY						
Kanagy, Amandus, Belleville	A-1	2	10.92	87	11	2
McCullough, Ralph, Kistler	A-1	1	13.15	80	20	0
Peachey, Jesse M., Belleville	A-1	1	13.5	86	12	2
Peachey, Urie S., Belleville	A-1	3	12.86	89	10	1
Rhoades, J. Allen, McVeytown	A-1	2	14.52	69	28	3
Ripple, Fred, Kistler	A	2.5	13.8	79	21	0
Sunderland, Ora, McVeytown	A-1	1	10.15	80	20	0
Valentine, Forrest E., McVeytown	A-1	2	16.75	70	30	0
Yoder, John M., Belleville	A	1.5	12.15	79	18	3
Yoder, Lee, Belleville	A-1	1	12.25	77	17	6
Zook, Israel B., Jr., Belleville	A	1	11.39	73	22	5
MONTGOMERY COUNTY						
Creamer, Marcus L., Horsham	A-1	5	10.80	70	28	2
Shaffer, David H., West Point	A-1	8	14.55	72	26	2
Wentz, Harry T., & George B. Wentz, Ambler	A-1	32	10.51	75	23	2
Zimmerman, Rudolph, Huntingdon Valley, R. D.	B-1	8	10.17	58	39	3
MONTOUR COUNTY						
Pursel, Bruce W., Danville, R. 4	A-1	1	15.79	81	19	0
Ranck, Howard G., Danville, R. 2	A	2	12.25	85	15	0
Rishel, D. R., Danville, R. 2	A	4.8	13.85	83	17	0
Robb, W. T., Danville, R. 3	A	4.5	11.1	81	19	0
Smith, Roy, Milton	A-1	3.5	10.55	84	16	0
Young, Doyle, Milton, R. 2	A	1	16.25	84	16	0

NORTHAMPTON COUNTY						
Borovies, Jos., Hellertown, R. 1	A-1	14	10.88	81	18	1
Duh, Stephen, Hellertown, R. 1	A-1	24	11.55	80	19	1
NORTHUMBRLAND COUNTY						
Dietrich, C. Harold, Milton, R. 1	A-1	4	10.12	66	33	1
Dimmick, William, Elysburg	A-1	2	10.4	88	12	0
Guintre, Bruce D., Milton, R. 1	A-1	3.5	12.56	86	14	0
Herman, Thomas W., Sunbury, R. 1	A-1	2	18.17	91	9	0
Hoffman, Cline, Muncy, R. 3	A-1	4	13.56	92	8	0
Keller, C. C., 622 N. 4th St., Sunbury	A	1	14.19	79	21	0
Lahr, Truman E., Sunbury, R. 3	A	4	12.75	80	19	1
Moore, Charles S., Sunbury, R. 1	A-1	2	13.14	94	6	0
Schnure, E. D., Milton, R. 2	A-1	8	10.00	72	27	1
Schuyler, S., Turbotville, R. 1	A	2	10.42	70	30	0
Showers, Clarence J., Milton, R. 1	A-1	3	11.03	82	18	0
Smith, C. P., Milton	A	3	10.34	75	25	0
Stine, William A., Elysburg	A-1	2	18.8	91	9	0
SCHUYLKILL COUNTY						
Adams, Fred, Tamaqua, R. 1	B	2	10.67			
Bensinger, Clarence, Tamaqua, R. 1	B-1	3	10.4			
Boyer, Homer, Tamaqua, R. 1	B	3	10.69			
Breiner, Fred, Tamaqua, R. 1	B-1	3	17.2			
Ebling, Ralph, Tamaqua, R. 1	B	1	12.2			
Godshall, Oliver, Barnesville	B-1	3	14.8			
Heisler, Arthur, Tamaqua, R. 1	B-1	7	12.25			
Hopper, Amandus, Tamaqua, R. 3	B	1	10.3			
Kraus, J. W., Barnesville	B-1	2	11.04			
Leiby, Daniel, Tamaqua, R. 1	B-1	1.75	18.42			
Leiby, Howard, Tamaqua, R. 1	B-1	4	15.91			
McLean, Robert, Pine Grove	B-1	1.5	10.03			
Moser, George, Ringtown	A	6	10.32	72	27	1
Moyer, Lewis D., Andreas, R. 1	A-1	12.5	11.21	68	31	1
Schock, Robert, Barnesville	B	3	17.72			
Stiegerwalt, Salem, Tamaqua, R. 3	B-1	2	11.33			
Troxell, John, Andreas	B-1	1.5	17.34			
Troxell, Lester, Andreas	B-1	1	12.13			
Wanner, Harvey, Zions Grove	A	2.5	11.86	83	17	0
Wildermuth, H. J., Pine Grove, R. 2	A-1	3	10.24	76	23	1
Zehner, J., New Ringgold, R. 1	B-1	1	10.7			
Zehner, Willard, Tamaqua, R. 3	B	1	11.97			
Ziegler, Theo, Andreas	B	1	16.2			

To Qualify for the Twenty-Ton Tomato Club

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Fertilizer —Dow Spray Materials — Meat Meal

READING BONE FERTILIZER CO.

READING, PA.

SNYDER COUNTY						
Berger, Urie L., Middleburg, R. 2	B-1	4	11.37			
Brouse, A. F., Selinsgrove, R. 1	A-1	2	16.23	83	17	0
Brubaker, Charles A., Port Trevorton, R. 2	A-1	2	10.98	70	30	0
Brubaker, Robert J., Port Trevorton, R. D.	A-1	2	10.45	82	18	0
Drumheller, J. E., Middleburg, R. 2	B-1	4	12.39			
Herman, A. S., Selinsgrove, R. 1	A-1	2	15.78	81	19	0
Kauffman, Harry, Selinsgrove, R. 2	A-1	3.5	14.9	73	27	0
Martin, Enos, Selinsgrove, R. 2	A-1	2.5	13.18	84	15	1
Rhoads, S. B., Selinsgrovee	A-1	3	11.64	87	13	0
Shaffer, M. R., Port Trevorton, R. 2	A	3	10.73	84	16	0
Smith, C. H., Middleburg, R. 2	B-1	3	12.34			
Stahl, N. E., Selinsgrove, R. 2	A	3	10.28	87	13	0
Stauffer, P. O., Selinsgrove, Star Route	A	4	10.06	76	23	1
Swineford, M. R., Middleburg, R. 2	A	6	12.47	78	22	0
Wentzel, F. E., Selinsgrove, R. 2	A-1	4	10.51	90	10	0
Yarger, Mrs. Charles, Middleburg, R. 2	A	2	11.31	87	13	0
UNION COUNTY						
Baker, S. L., Lewisburg, R. 2	A-1	4	12.37	85	15	0
Bilger, James, Weikert	B-1	2	10.05	58	41	1
Erdley, H. R., Mifflinburgg, R. 2	A-1	8	10.3	79	21	0
Minium, M. E., Lewisburg, R. 3	A-1	4	12.09	83	16	1
Mowery, H. C., Mifflinburg, R. 1	A-1	2	14.38	87	12	1
Shreck, W. L., New Columbia, R. 1	A-1	6	10.20	74	25	1
Smozinsky, R. C., Lewisburg, R. 3	A-1	4	17.62	88	12	0
Spangler, G. L., Lewisburg, R. 2	A-1	2	15.13	80	20	0
Stahl, William, Lewisburg, R. 2	A-1	3	16.12	71	29	0
Wolfe, W. R., Mifflinburg, R. 1	A-1	4	10.20	80	20	0

A dollar, sent to The Pennsylvania Vegetable Growers' Association, Secretary, State College, Pa., entitles you to a yearly membership in your own and only association of vegetable growers in the state. This Report, the Market Growers' Journal (monthly) and the News (quarterly) will be sent for this same dollar, with or without membership, as preferred.

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YORK COUNTY

Adams, E. C., Spring Grove, R. 2	A	1.94	13.61	73	27	0
Baumgardner, Elmer, Spring Grove, R. 3	A	2.04	12.11	84	16	0
Baumgardner, H. R., Hanover, R. 2	A	1.5	10.2	61	38	1
Beck, Edgar R., York, R. 6	B-1	4.5	11.8			
Binner, H. W., Dillsburg, R. 1	A-1	5	11.24	73		
Bollinger, S. H., Spring Grove, R. 3	A	6	10.44	65	34	1
Bose, Lloyd G., Glen Rock	B-1	1	17.1			
Bowman, David, Thomasville, R. 1	A	2	10.13	76	24	0
Brenneman, C. R., Stewartstown, R. 3	B	1.5	12.0			
Brose, William O.	B-1	2	16.0			
Cool, J. E., Spring Grove, R. 2	A	1.25	11.13	85	15	0
Diehl, Harry L., Stewartstown	B-1	2.5	12.8			
Diehl, Leroy D., Spring Grove, R. 1	A-1	1.6	10.54	87	13	0
Dusman, J. W., Hanover, R. 2	A-1	2.75	10.0	74	26	0
Fleming, Charles, Dillsburg, R. 1	A	8.18	11.21	75		
Frantz, Chas. P., Seven Valleys	B-1	6	16.3			
Gobrecht, William, Hanover, R. 2	A-1	5.76	10.69	72	27	1
Goodling, C. S., Seven Valleys	B-1	1.2	16.4			
Graham, Earl, Red Lion, R. 1	B-1	1	11.0			
Gray, Ray W., Hanover, R. 3	A	2.65	10.16	76	24	0
Hartin, W. H., Menges Mills	A-1	4.25	10.00	72	25	3
Hartman, Paul B., York, R. 2	B-1	2	16.25			
Haugh, E., Wrightsville, Box 43	A	4	10.17	68	32	0
Hengst, Preston E., York, R. 6	B-1	2	11.5			
Hersh, Henry, Spring Grove, R. 2	A-1	2.75	11.54	77	23	0
Hersh, S., Seven Valley, R. 1	A	3.73	17.74	74	26	0
Hursh, Jesse, Codorus	A	1.85	10.74	88	12	0
Hetrick, Edw. J., Brodbecks, R. 1	A	1	12.01	80	20	0
Jenkins, D., Stewartstown, R. 1	B-1	1	11.0			
Kaltreider, Paul, Brodbecks, R. 1	A-1	1	12.12	72	27	1
Keener, Clayton A., York, R. 6	A	1.5	11.21	76	24	0
Kessler, Chas. E., Spring Grove	B	3.2	10.3	80	20	0
Kline, N. A., New Freedom	B-1	1	11.5			
Klinedinst, Wm. M., Seven Valleys	B-1	5	12.0			
Krout, Edwin, Seven Valleys	B-1	2	18.75			
Lehman, Stewart, Dillsburg, R. 1	B	8.27	14.1	71		
Lentz, A. O., Glen Rock, R. 2	B-1	2	10			
Lentz, Erney, York, R. 6	A-1	1	12.41	65	35	0
Lightner, W. J., Spring Grove, R. 3	A-1	1.54	12.16	79	21	0
Little, John R., Hanover, R. 3	A-1	3.5	11.56	78	22	0
Luckenbaugh, John, Spring Grove, R. 2	A	2.01	11.14	90	10	0
Markey, R. E., York, R. 2	B-1	3	19.5			
Martin, E., Spring Grove, R. 3	A	1	10.35	82	18	0
Martin, W. H., Menges Mills	B	4.5	10.0			
Messersmith, H., & H. Stambaugh, Spring Grove, R. 2	A-1	4.2	14.24	78	22	0
Miller, Charles K., Stewartstown	B-1	4	11.25			
Miller, Harry L., Laurel	B-1	2.5	11.6			
Mosebrook, J., Spring Grove, R. 2	A	2.7	10.35	83	17	0
Mummert, Roy, Spring Grove, R. 2	A	2.1	12.89	90	10	0
Myers, Guy, Seven Valleys	B-1	4.5	10.3			
Renoll, Robt., Spring Grove, R. 2	A	2.16	10.73	75	25	0
Rishel, Norman E., York, R. 5	A	2.05	10.03	72	28	0
Roth, John, Jr., Spring Grove, R. 1	A-1	3.39	11.39	75	25	0

Rohrbaugh, Paul, Glen Rock	B-1	3.5	14.28			
Rudisill, W. S., Spring Grove, R. 1	A-1	2.25	10.01	75	23	2
Rohrbaugh, E., Spring Grove, R. 2	A	2.61	10.37	81	19	0
Rupprecht, Amos, Spring Grove	A	2	10.11	78	22	0
Ruth, Wm. A., Spring Grove, R. 1	A-1	8.9	10.78	79	20	1
Saylor, John D., Red Lion, R. 1	B-1	3	10.6			
Senft, John R., Spring Grove, R. 1	A	3.1	10.19	74	26	0
Shaffer, Edman, Spring Grove, R. 2	A	2.4	10.92	87	13	0
Shank, Jacob, Hanover, R. 3	A-1	2.05	10.01	75	25	0
Shaub, Alvin, New Freedom	B-1	7	11.42			
Sheaffer, M. R., Dillsburg	A	4.3	12.52	64		
Shearer, E. B., Spring Grove, R. 1	A-1	2.48	14.70	78	22	0
Shorb, Harry, Hanover, R. 2	A	1.43	17.64	78	22	0
Shorb, Paul, Hanover, R. 2	A	2.2	10.0	73	27	0
Spahr, M. E., Thomasville, R. 1	A	2.23	11.05	75	24	1
Snyder, Clarence C., Red Lion, R. 1	B-1	3	12.6			
Spangler, John, Spring Grove, R. 3	A-1	3.08	11.25	88	22	0
Sprenkle, Harry, & Luckenbaugh, Menges Mills	A	1	10.69	66	34	0
Sterner, Gordon, Hanover, R. 2	A-1	5.28	11.13	81	19	0
Swartz, Charles W., New Freedom	B-1	2	12.12			
Sweitzer, D. R., New Freedom, R. 1	B-1	2	10.5			
Thomas, Lester, Spring Grove, R. 3	A-1	1.77	10.53	81	19	0
Trone, Arthur, Spring Grove, R. 2	A	2.32	10.83	79	21	0
Tyson, Irwin, Red Lion, R. 2	B-1	2	10.5			
Weber, George G., York	A-1	7.92	11.91	74	25	1
Whitecraft, C., Seven Valleys	B-1	2	12.25			
Wright, Dr. F. W., Eichelberger St., Hanover	A	1	10.06	69	29	2
Whiteford, Michael, Glen Rock, R. 2	B-1	2	11.0			
Wonder, Ralph H., Hanover, R. 3	A	2.3	10.24	91	9	0
Young, Gilmore, Spring Grove, R. 1	A	1.86	12.84	72	28	0

Too late to classify:

Cline, John F., Brodbecks, R. 1	A	2	13.04	70	30	0
Stough, Wm. H., York, R. 6	A	2.25	10.73	76	24	0

Plan now to produce 20 tons of tomatoes per acre with 75%, or more, rich red, high vitamin C tomatoes in 1944. A record of production practices is needed on both high and low yields to maintain continued progress (page 6).

HARRIS' SEEDS

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Building Soils for Higher Yields

Some Principles of Soil Management

FRED V. GRAU*

Cutting through current controversies over the subject of methods of tillage are certain fundamentals of soil management which, if practiced, lead to higher crop yields. Large yields lead to lowered unit costs of production and any practice which attains this objective is worthy of consideration.

Soil management will vary in accordance with physical characteristics, rainfall, temperature and other factors, but the primary objectives are:

1. To maintain an adequate supply of mineral elements in available form continuously to feed the crop according to its needs and to bring it to maturity without a deficiency at any time.

2. To provide conditions within the soil to utilize the natural rainfall to the fullest degree and, insofar as possible, to store large quantities of water against a possible deficiency so that the crop will grow and mature without interruption.

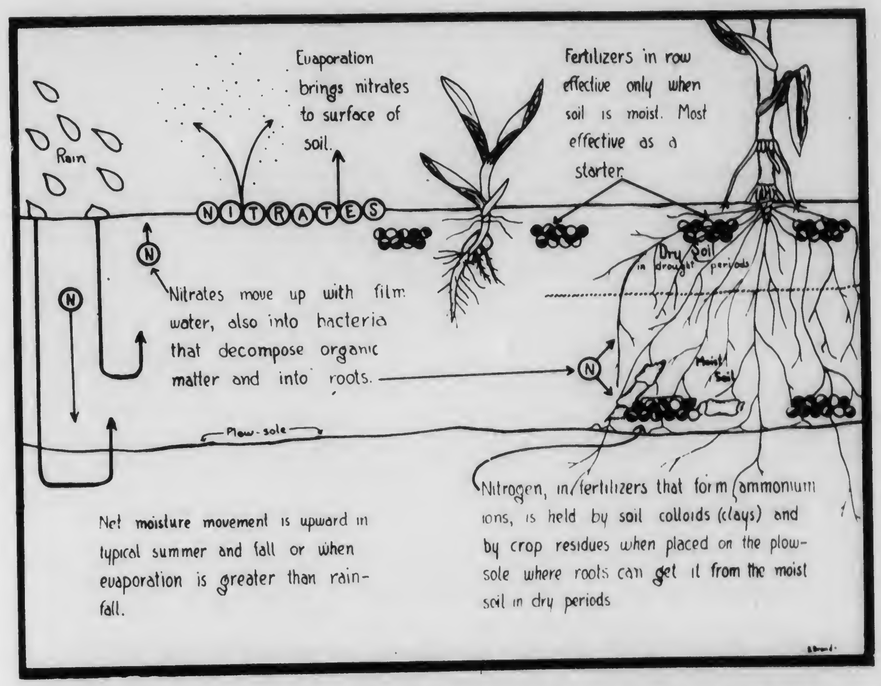
A brief review of the soil complex may help us better to apply the principles of good soil management. It is not the intention to make specific recommendations in this paper but to attempt to clarify the reasons for existing recommendations. It is axiomatic that we do things better when we understand WHY!

The two physical factors in soils which we can alter or affect by good management are:

1. CLAY consists of the very fine particles which give **Character** and **Personality** to soils. Clay particles adsorb (hold on the surface by electrical attraction, like a magnet) many mineral elements (potash, calcium, ammonia, magnesium and others) where they are held until used by the plant. Clay particles granulate (group together like a bunch of grapes) in the presence of lime and organic matter, thus promoting drainage, aeration, moisture retention, and microbial growth.

2. **ORGANIC MATTER** is the dynamic (always changing) part of soil which gives **life** to the soil and contribtues to its character and personality. It is the sum total of animal and plant residues, living and dead. More than any one soil factor, the organic matter content deserves the greatest attention since it improves both clay soils and sandy soils.

* Dr. Grau is Extension Specialist in Agronomy, The Pennsylvania State College, State College, Pa.


Evaporation brings nitrates to surface of soil.
Rain
Fertilizers in row effective only when soil is moist. Most effective as a starter.
NITRATES
Dry Soil in drought periods
Nitrates move up with film water, also into bacteria that decompose organic matter and into roots.
Plow-sole
Net moisture movement is upward in typical summer and fall or when evaporation is greater than rainfall.
Nitrogen, in fertilizers that form ammonium ions, is held by soil colloids (clays) and by crop residues when placed on the plow-sole where roots can get it from the moist soil in dry periods

This diagram, after Purdue Bul. 482, shows how nitrogen, in the form of nitrates (NO_3), moves freely in the soil in solution. When evaporation is greater than rainfall, nitrates move to the surface where they are left when the moisture evaporates. Frequent summer rains move nitrate back into the soil where roots can absorb it. During moderate drought periods when the surface soil is dry, roots continue to feed on plant nutrients in the moist soil. Nitrogen in the ammonium form is held by the clay particles and does not move in the soil. Placed deeply, it is available during dry periods.

Mineral nutrients in the soil, for the purposes of our discussions, fall into three general classes;—(1) **Held** by clay and organic matter particles (not free to move) and "available" to plant roots—calcium, potash, sodium and ammonia forms of nitrogen and included. (2) **Not held,** and thus free to move in the soil in solution and available to plants—nitrate nitrogen chiefly, and (3) **Fixed** in the soil and made unavailable by insoluble combinations—PHOSPHORUS. Since so much of our crop yields depends upon applied fertilizers, and since fertilizers are so much influenced in their effectiveness by soil conditions, it is of utmost importance to prepare the soil most effectively to utilize these materials. Since organic matter is our chief concern, let us review some of its functions in the soil.

YORK COUNTY

Adams, E. C., Spring Grove, R. 2	A	1.94	13.61	73	27	0
Baumgardner, Elmer, Spring Grove, R. 3	A	2.04	12.11	84	16	0
Baumgardner, H. R., Hanover, R. 2	A	1.5	10.2	61	38	1
Beck, Edgar R., York, R. 6	B-1	4.5	11.8			
Binner, H. W., Dillsburg, R. 1	A-1	5	11.24	73		
Bollinger, S. H., Spring Grove, R. 3	A	6	10.44	65	34	1
Bose, Lloyd G., Glen Rock	B-1	1	17.1			
Bowman, David, Thomasville, R. 1	A	2	10.13	76	24	0
Brenneman, C. R., Stewartstown, R. 3	B	1.5	12.0			
Brose, William O.	B-1	2	16.0			
Cool, J. E., Spring Grove, R. 2	A	1.25	11.13	85	15	0
Diehl, Harry L., Stewartstown	B-1	2.5	12.8			
Diehl, Leroy D., Spring Grove, R. 1	A-1	1.6	10.54	87	13	0
Dusman, J. W., Hanover, R. 2	A-1	2.75	10.0	74	26	0
Fleming, Charles, Dillsburg, R. 1	A	8.18	11.21	75		
Frantz, Chas. P., Seven Valleys	B-1	6	16.3			
Gobrecht, William, Hanover, R. 2	A-1	5.76	10.69	72	27	1
Goodling, C. S., Seven Valleys	B-1	1.2	16.4			
Graham, Earl, Red Lion, R. 1	B-1	1	11.0			
Gray, Ray W., Hanover, R. 3	A	2.65	10.16	76	24	0
Hartin, W. H., Menges Mills	A-1	4.25	10.00	72	25	3
Hartman, Paul B., York, R. 2	B-1	2	16.25			
Haugh, E., Wrightsville, Box 43	A	4	10.17	68	32	0
Hengst, Preston E., York, R. 6	B-1	2	11.5			
Hersh, Henry, Spring Grove, R. 2	A-1	2.75	11.54	77	23	0
Hersh, S., Seven Valley, R. 1	A	3.73	17.74	74	26	0
Hursh, Jesse, Codorus	A	1.85	10.74	88	12	0
Hetrick, Edw. J., Brodbecks, R. 1	A	1	12.01	80	20	0
Jenkins, D., Stewartstown, R. 1	B-1	1	11.0			
Kaltreider, Paul, Brodbecks, R. 1	A-1	1	12.12	72	27	1
Keener, Clayton A., York, R. 6	A	1.5	11.21	76	24	0
Kessler, Chas. E., Spring Grove	B	3.2	10.3	80	20	0
Kline, N. A., New Freedom	B-1	1	11.5			
Klinedinst, Wm. M., Seven Valleys	B-1	5	12.0			
Krout, Edwin, Seven Valleys	B-1	2	18.75			
Lehman, Stewart, Dillsburg, R. 1	B	8.27	14.1	71		
Lentz, A. O., Glen Rock, R. 2	B-1	2	10			
Lentz, Erney, York, R. 6	A-1	1	12.41	65	35	0
Lightner, W. J., Spring Grove, R. 3	A-1	1.54	12.16	79	21	0
Little, John R., Hanover, R. 3	A-1	3.5	11.56	78	22	0
Luckenbaugh, John, Spring Grove, R. 2	A	2.01	11.14	90	10	0
Markey, R. E., York, R. 2	B-1	3	19.5			
Martin, E., Spring Grove, R. 3	A	1	10.35	82	18	0
Martin, W. H., Menges Mills	B	4.5	10.0			
Messersmith, H., & H. Stambaugh, Spring Grove, R. 2	A-1	4.2	14.24	78	22	0
Miller, Charles K., Stewartstown	B-1	4	11.25			
Miller, Harry L., Laurel	B-1	2.5	11.6			
Mosebrook, J., Spring Grove, R. 2	A	2.7	10.35	83	17	0
Mummert, Roy, Spring Grove, R. 2	A	2.1	12.89	90	10	0
Myers, Guy, Seven Valleys	B-1	4.5	10.3			
Renoll, Robt., Spring Grove, R. 2	A	2.16	10.73	75	25	0
Rishel, Norman E., York, R. 5	A	2.05	10.03	72	28	0
Roth, John, Jr., Spring Grove, R. 1	A-1	3.39	11.39	75	25	0

Rohrbaugh, Paul, Glen Rock	B-1	3.5	14.28			
Rudisill, W. S., Spring Grove, R. 1	A-1	2.25	10.01	75	23	2
Rohrbaugh, E., Spring Grove, R. 2	A	2.61	10.37	81	19	0
Rupprecht, Amos, Spring Grove	A	2	10.11	78	22	0
Ruth, Wm. A., Spring Grove, R. 1	A-1	8.9	10.78	79	20	1
Saylor, John D., Red Lion, R. 1	B-1	3	10.6			
Senft, John R., Spring Grove, R. 1	A	3.1	10.19	74	26	0
Shaffer, Edman, Spring Grove, R. 2	A	2.4	10.92	87	13	0
Shank, Jacob, Hanover, R. 3	A-1	2.05	10.01	75	25	0
Shaub, Alvin, New Freedom	B-1	7	11.42			
Sheaffer, M. R., Dillsburg	A	4.3	12.52	64		
Shearer, E. B., Spring Grove, R. 1	A-1	2.48	14.70	78	22	0
Shorb, Harry, Hanover, R. 2	A	1.43	17.64	78	22	0
Shorb, Paul, Hanover, R. 2	A	2.2	10.0	73	27	0
Spahr, M. E., Thomasville, R. 1	A	2.23	11.05	75	24	1
Snyder, Clarence C., Red Lion, R. 1	B-1	3	12.6			
Spangler, John, Spring Grove, R. 3	A-1	3.08	11.25	88	22	0
Sprenkle, Harry, & Luckenbaugh, Menges Mills	A	1	10.69	66	34	0
Sterner, Gordon, Hanover, R. 2	A-1	5.28	11.13	81	19	0
Swartz, Charles W., New Freedom	B-1	2	12.12			
Sweitzer, D. R., New Freedom, R. 1	B-1	2	10.5			
Thomas, Lester, Spring Grove, R. 3	A-1	1.77	10.53	81	19	0
Trone, Arthur, Spring Grove, R. 2	A	2.32	10.83	79	21	0
Tyson, Irwin, Red Lion, R. 2	B-1	2	10.5			
Weber, George G., York	A-1	7.92	11.91	74	25	1
Whitecraft, C., Seven Valleys	B-1	2	12.25			
Wright, Dr. F. W., Eichelberger St., Hanover	A	1	10.06	69	29	2
Whiteford, Michael, Glen Rock, R. 2	B-1	2	11.0			
Wonder, Ralph H., Hanover, R. 3	A	2.3	10.24	91	9	0
Young, Gilmore, Spring Grove, R. 1	A	1.86	12.84	72	28	0

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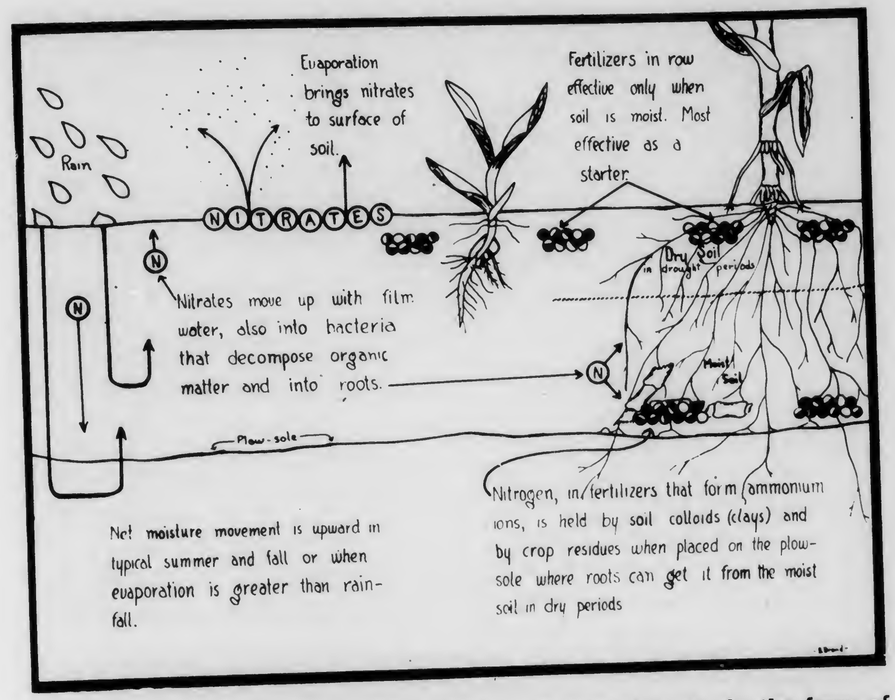
Rain
Evaporation brings nitrates to surface of soil.
Fertilizers in row effective only when soil is moist. Most effective as a starter.
NITRATES
Dry Soil in drought periods
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Plow-sole
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Nitrogen, in fertilizers that form ammonium ions, is held by soil colloids (clays) and by crop residues when placed on the plow-sole where roots can get it from the moist soil in dry periods

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Organic matter in the soil in adequate amounts does these things:

1. **Increases permeability.** Rainfall is absorbed more readily, thus run-off and erosion are reduced.
2. **Furnishes energy** for the microbial life in the soil, which among other things causes granulation.
3. **Stabilizes granules** by coating them with an organic film, which retards water movement and thus reduces the rate of loss both by leaching and by evaporation.
4. **Improves drainage** and aeration by creating a stable granular condition. Root growth is encouraged by good drainage and aeration.
5. **Releases plant food** by the action of CO_2 (carbon dioxide). CO_2 is formed by decaying organic matter and, in solution, is a mild acid and an excellent solvent for mineral elements..
6. **Creates a reservoir** for holding moisture and mineral nutrient elements. Moist soils make fertilizers more effective, or stated differently, fertilizers are effective only in moist soils.
7. **Makes tillage easier,** particularly in heavy clay soils.

Organic matter materials which are plowed under contain primarily either or both of these:

1. **Active** organic matter. The easily-decomposable material such as sugars and starches which are contained in green succulent crops like small grains and legumes. Bacteria need this for **energy** to carry on their work. Material of this type is quickly lost and results in little permanent improvement.

Limestone and manure applied to sod before plowing facilitates thorough mixing, stimulates microbial growth.

Ryegrass cover crop turns like old sod. High woody organic matter content in roots may require additional nitrogen for satisfactory decomposition.

2. **Inactive** organic matter. The woody parts of plants or the horny and bony parts of animals which decompose slowly. This material is important in **coating the granules** with a film to make them stable. Mature rye, wheat straw and sawdust contain more of the woody or inactive organic matter than green crops. Material containing mostly this type rob the soil of nitrogen because there is insufficient active material to encourage the bacteria.

Organic matter is most cheaply and effectively built up in the soil by the following practices:

1. **Lime** sufficient to produce a nearly neutral condition (pH 6.5 to 6.7) mixed in the soil throughout the entire plow depth. The desirable microbial population flourishes best at this pH range and the majority of legumes and other farm crops are benefited. A good place for lime is on a sod crop or cover crop before plowing it under. Half plowed down and half harrowed in is good practice.
2. **Grass** or a **grass-legume mixture** as grown at least every third or fourth year to turn under so that a large total amount of active and inactive organic material is made available to the microbial population.

Organic matter in the soil in adequate amounts does these things:

1. **Increases permeability.** Rainfall is absorbed more readily, thus run-off and erosion are reduced.
2. **Furnishes energy** for the microbial life in the soil, which among other things causes granulation.
3. **Stabilizes granules** by coating them with an organic film, which retards water movement and thus reduces the rate of loss both by leaching and by evaporation.
4. **Improves drainage** and aeration by creating a stable granular condition. Root growth is encouraged by good drainage and aeration.
5. **Releases plant food** by the action of CO_2 (carbon dioxide). CO_2 is formed by decaying organic matter and, in solution, is a mild acid and an excellent solvent for mineral elements..
6. **Creates a reservoir** for holding moisture and mineral nutrient elements. Moist soils make fertilizers more effective, or stated differently, fertilizers are effective only in moist soils.
7. **Makes tillage easier,** particularly in heavy clay soils.

Organic matter materials which are plowed under contain primarily either or both of these:

1. **Active** organic matter. The easily-decomposable material such as sugars and starches which are contained in green succulent crops like small grains and legumes. Bacteria need this for **energy** to carry on their work. Material of this type is quickly lost and results in little permanent improvement.

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INTENTIONAL SECOND EXPOSURE

3. **Adequate plant food** provided to produce maximum growth in the sod crop. Mainly N-P for straight grasses, mainly P-K for grass legume mixtures. Manure is used effectively in stimulating the sod crops or cover crops before plowing down.
4. **Deep plowing** so as to entirely destroy the sod crop and to mix it well throughout the plow layer. Surface tillage to leave the trash on the surface may be found satisfactory if it is discovered that perennial sod-forming plants can be completely killed so as not to interfere with the main crop.

Sod crops (cover crops or green manure crops) which are readily grown and which provide large quantities of both active and inactive organic matter when destroyed fall into two general classes, each subdivided according to rapidity of growth:

Sweet clover plowed down when spring growth is well-started leaves soil mellow, rich in active organic matter.

Compliments

INDEPENDENT MANUFACTURING CO.

FERTILIZERS

WHEATSHEAF LANE

FRANKFORD

Philadelphia, Pennsylvania

	Annuals and winter annuals (quick-growing)	**Biennials and perennials (slow-growing)**
Legumes (fix nitrogen)	Vetch, soybeans, cowpeas	Sweet clover, alfalfa, red, white and alsike clovers
Grasses (require nitrogen)	Ryegrass, cereal grains, sudan grass, millet	Orchard grass, timothy, meadow fescue (also Alta) bromegrass, tall oat grass, Reed canary grass, bluegrass
Grass-legume mixtures widely-favored for soil-building (preferred over single species)	Spring sown: oats and peas Summer sown: sudan grass and soybeans or millet and soybeans Fall sown: Wheat and vetch or rye and vetch	Orchard-Ladino Orchard-alfalfa Orchard-Sweet clover brome-alfalfa

Summary

For better soil management to increase crop yeilds it is essential to incorporate ample supplies of both succulent and woody types of organic matter into the soil as frequently as possible, at least every three to four years:

By 1. The use of lime, manure, and fertilizers
2. Selected grasses, legumes, or mixtures
3. Deep plowing to destroy the sod crop and incorporate it into the soil uniformly

For 1. Increased growth of microbial population
2. Increased permeability, aeration and drainage

To 1. Make the soil a better storage reservoir for moisture and nutrient elements
2. Stabilize soil granules
3. Reduce erosion
4. Make tillage easier
5. Render fertilizers more effective and efficient

F. W. TUNNELL & COMPANY, INC.

15 North Fifth Street, Philadelphia, Pa.

Manufacturers of ANIMAL MATTER FERTILIZERS—The Balanced Ration Plant Food—Since 1900. Make sure of your fertilizer this year—everything counts for **Victory.**

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INTENTIONAL SECOND EXPOSURE

Brisk Markets—High Prices

for Fruits and Vegetables in 1944

YOU CAN GET YOUR SHARE

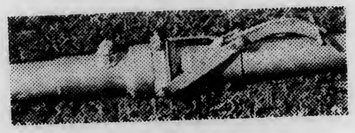
Your produce can be high in both Quality and Quantity if you use the

CALCO PORTABLE RAINMAKER

Then you will have rain when, where and as much as you want.

The Rapid Action Coupling makes the joining and disjoining of pipe sections a quick and easy matter.

Send a postal for full information and the name of the nearest dealer.



California Corrugated Culvert Co.

7th & Parker Streets

Berkeley, California

Fertilizer drilled in bands 4 inches deep and 7 inches apart, after the soil has been deeply and thoroughly prepared. This method gives excellent results when additional fertilizer is applied along the row and starter solution is used.

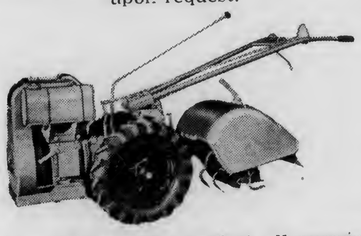
THE ONLY COMPLETE LINE OF ROTARY TILLAGE EQUIPMENT

FOR THE

VEGETABLE GROWER

Catalog and name of nearest distributor upon request.

Ariens Tractortiller does a complete job of fitting the soil after plowing without leaving wheel tracks on the field. Depth of operation up to 12 inches. It harrows, discs, levels and packs the soil in ONE operation. Standard in two sizes—4 and 5 feet.



Ariens Tillers—the perfect all-purpose tilling and cultivating combine, produce level seed bed completely pulverized in ONE operation—3 models to meet your requirements.

ORDNANCE — UNITED STATES ARMY

Ariens flies the Ordnance Banner for meritorious production—awarded October 30, 1943.

ARIENS COMPANY

BRILLION, WISCONSIN

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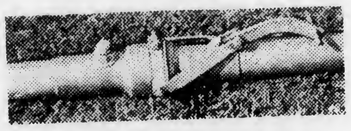

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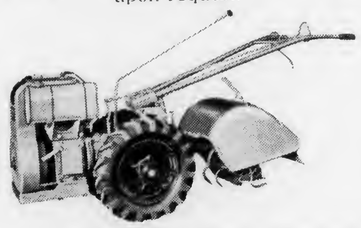

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INTENTIONAL SECOND EXPOSURE

VEGETABLE GROWERS

Attention Please!

You Have Read About the Very Valuable

New Extra Early Tomato

"PENNHEART"

It is the newest scientific development in Tomato Breeding by Dr. C. E. Myers, plant breeding expert of our Pennsylvania State College of Agriculture.

Mr. William B. Kille, large, successful vegetable grower of New Jersey, says:

"I harvested 200 five-eights baskets by July 7th and got $3.00 per basket. This acre yielded a total of 866 bushels."

Now, if you want to see a picture in natural colors of a very magnificent crop of this new Pennheart Tomato—then write for a free copy of our new 1944 Market-Gardeners Catalogue. We show it on the front cover as grown here on our own farm.

It is extra-early — It has size — It has color — It yields tremendously.

Don't Miss Starting Some New Pennheart In March for Tomatoes for July 4th

An acre can easily make you a thousand dollars.

WRITE TODAY
FOR OUR CATALOGUE

It is full of good things you will want.

Try our Schell's Jet Black Strain of Black Beauty Eggplant.

They'll bring you a premium price.

All Our Strains Are Pure-bred High Yielding Strains.

They Bring Top Prices On All Markets.

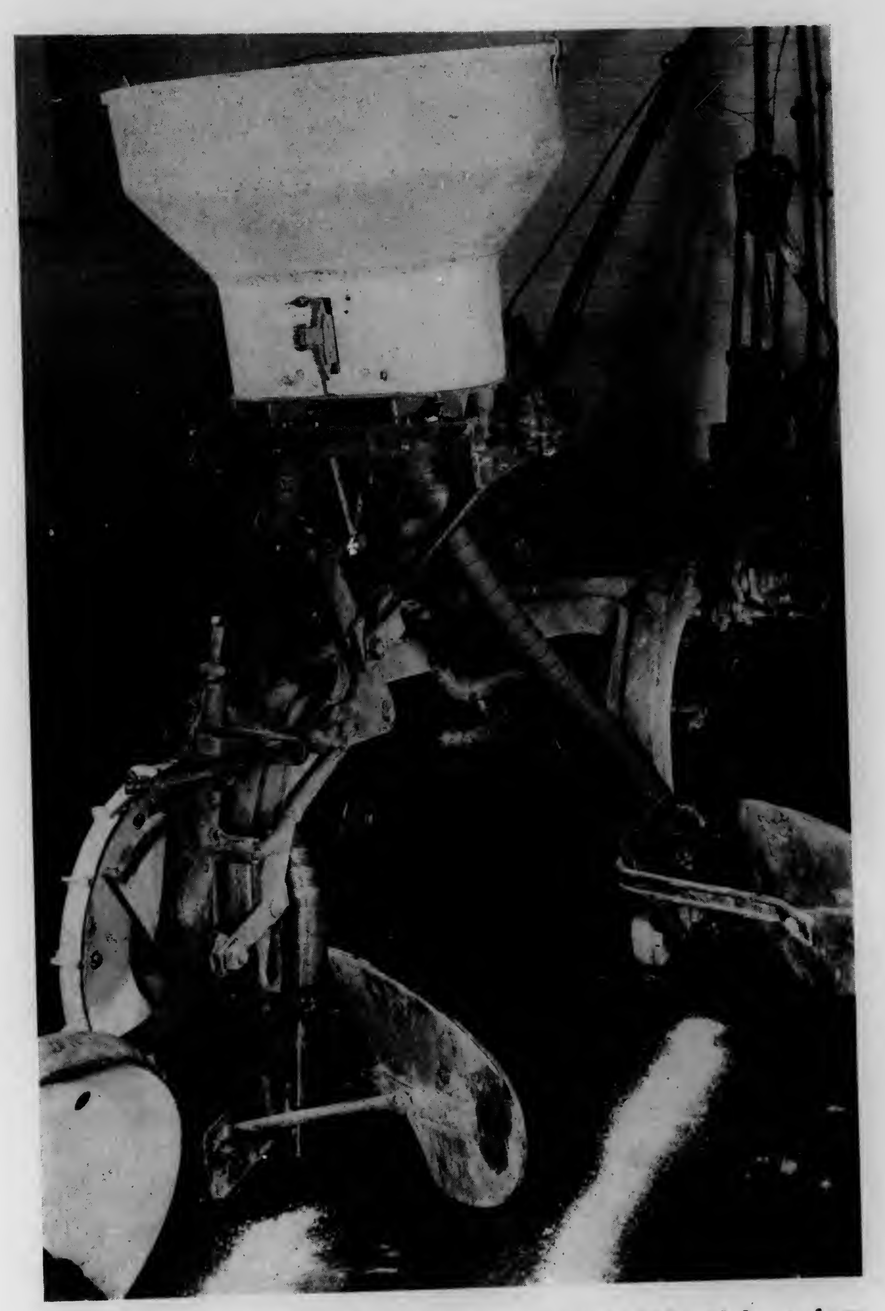
It Pays To Plant Schell's Quality Seeds.

They Grow Better :: They Yield Better

SCHELL'S SEED HOUSE

QUALITY SEEDS

Tenth and Market Streets **Harrisburg, Pa.**



A fertilizer attachment for a two-bottom plow designed by a farm machinery manufacturer for plowing down fertilizer in bands. (Courtesy of Pa. Agr. Expt. Sta., Bul. 443).

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Tomato Fertilizer Demonstration. Lycoming County Agricultural Extension Association. Differences shown Sept. 9, after the third picking.

No Fertilizer. 22 tomatoes per plant.

800 lbs. per acre drilled; 200 lbs. row. 32 tomatoes per plant.

800 lbs. per acre in bands, furrow bottom; 200 lbs. row. 45 tomatoes per plant.

Jesse M. Huffington*

Twenty demonstrations in Pennsylvania in 1943 show that generally unfavorable results occur where the total fertilizer application is plowed down. The best results were obtained, as a rule, from combined applications along (but not in) the row and drilled deeply or plowed down in single bands in the furrow bottom. Plant starter solution, also greatly aids in giving the plant a good start, when it is set deeply. Some growers applied a part of the fertilizer with a disc drill, in bands, just below the surface before plowing in order to lighten the labor load required by drilling after plowing.

Results in New Jersey favor drilling fertilizer in bands 4 inches deep and 7 inches apart, in addition to the row application, according to Dr. F. E. Bear, whose work was with the corn crop.

If **plant starter** cannot conveniently be purchased, it may be prepared at home by dissolving 3-12-6, or similar, fertilizer in water, 1 lb. to 1 gallon (preferably, suspended in a bag), for 1 day and using 8 gallons in a 50-gallon planter tank (1 to 5). This may be used to wet the roots of plants before setting or to water plants as they are set in the field.

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* Vegetable Gardening Extension Specialist, The Pennsylvanit State College, State College, Pa.

Tomato Production in New York State

C. B. RAYMOND*

The tomato canning industry of New York State, including both the processing and the production of the crop has long held a rather envious position. The government reports have shown that the average yield of the cannery tomatoes in New York has generally been higher than for any other state growing an equal acreage and, in fact, has only been exceeded regularly by Utah. The most recent government report gives the average yield for the ten years, 1932 to 1941 inclusive, as 7.6 tons an acre. The last two years have not been up to this average, giving us only 7.2 and 6.1 respectively. Most of the New York tomato region suffered from too much rainfall in 1943. The cool climate of New York State is considered a very favorable factor in helping to produce the high yields and to maintain the high quality, but this also limits the production area to the regions that have the advantage of frost protection from Lake Erie and Lake Ontario.

There is doubtless no one item of greater concern to the tomato grower than that of fertilizer. Consideration of fertilizer always brings up three questions or problems. First there is the problem of deciding what analysis fertilizer to use, and then comes the closely allied question of how many pounds per acre can be used most profitably. With the necessary changes in analyses, the last two years, many growers are now combining these two questions into one and talk in terms of the number of pounds of nitrogen, phosphorus and potassium that should be applied to each acre. If the confusion that has been caused by the limitation of materials during these war years ultimately results in fertilizer applications being considered by growers in terms of the pounds of nitrogen, phosphorus, and potash to use for each crop acre, the result in years to come will be worth all of the confusion that has been caused in the meantime.

A down-the-road survey of 165 tomato growers in two of the leading regions of the state in 1941 showed that there was an average of slightly more than 650 pounds of commercial fertilizer used on each acre of tomatoes. In addition the tomato crop had the benefit of an average of more than three tons of stable manure to each acre. As there was no limitation on analyses at that time, many widely different ones were used, but the big majority of them were fertilizers high in phosphorus, such as the 5-20-5 or 4-12-4.

The third fertilizer question confronting growers in recent years and the one that has to be answered with many "Ifs" or "Buts" concerns the most effective way to apply the fertilizer. The answer to this question is of necessity limited by the equipment available on the individual farm. One thing most certain is that the fertilizer should be placed well down into the soil. In the afore mentioned survey of 1941 it was learned that more than half of the growers applied all

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INTENTIONAL SECOND EXPOSURE

The smaller growth of the center row is due to just omitting 100 pounds of a complete fertilizer as with band application with the setter.

of their fertilizer broadcast either with a grain drill or a lime sower. In some cases it was worked into the soil in the course of preparation of the land, but on most farms it was drilled deeply just before the plants were set. Approximately another third of this group applied all of their fertilizer as row applications, either with the plant setter, a potato planter, or a grain drill having the tubes pulled together at the rows. The rest of the men used a combination of two or more of these methods, generally applying from 200 to 300 pounds in bands close to the plants either before setting or with a cultivator attachment two to four weeks after setting. Because there was so much difference in the quantities applied on the different farms and other differing practices, it is not safe to compare the yields as being directly related to the method of fertilizer application.

Carefully arranged experiments on fertilizer placement for tomatoes have been conducted for several years by Prof. C. B. Sayre, head of the Vegetable Crops Department at the Agricultural Experiment Station at Geneva. In 1942 and 1943 these were extended to include three distinct regions of the state and three widely different types of soil. These experiments included studies to determine the placements

and the quantities of nitrogen, phosphorus, and potash that would give the best results. A 3-12-6 analysis fertilizer was used in two of these experiments, but because higher phosphorus fertilizers had previously been most effective at the Geneva location the 5-20-5 was used in that placement experiment. The rates of application at the different locations were from 600 to 1200 pounds an acre. While the differences in yield were not great, the highest yield in each of the three experiments in 1943 were from the plots where at least half of the fertilizer was plowed under, but with 200 pounds or more applied in bands 2½ inches to the side of the plants and 4 inches deep.

Six hundred pounds of the 5-20-5, all in bands, caused some injury to the roots in the 1942 experiment at Geneva, and so did not produce as high a yield as only 200 pounds in bands. In 1943 with heavy rainfall soon after setting, there was no indication of root injury from the 600 pound band application, but it still failed to produce a profitably higher yield than the 200 pound band application, or as high or as profitable a yield as the combination band and plowing under method. These three experiments this year gave further support to the feasibility of plowing under part of the fertilizer for tomatoes and of supplementing this with light applications in bands.

The results of varying the quantities of nitrogen, phosphorus and potassium in each of these three experiments were not at all conclusive. In 1942, nitrogen gave the most influence on yield on the Ontario Loam soil at Geneva, while potassium gave the greatest influence on the Palmyra Stony Loam, and phosphorus on the Fulton Clay Loam. In the wet season of 1943, the yield differences due to variable quantities of nitrogen, phosphorus, and potassium were not at all outstanding on any of the three soils. The two years taken together look like further evidence that the rainfall and perhaps other climatic factors as well as crop rotations and soil types may greatly influence the quantity of nitrogen, phosphorus and potash that it is profitable to apply. The safe practice is to be certain that the quantity of fertilizer applied is sufficient so that the three common fertilizer nurtients are not limiting the yield of tomatoes.

ROBSON SEED FARMS, BOX P
HYBRID SWEET CORN
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New York State seed always
tops the market.
Write for free 1944 descriptive
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and the quantities of nitrogen, phosphorus, and potash that would give the best results. A 3-12-6 analysis fertilizer was used in two of these experiments, but because higher phosphorus fertilizers had previously been most effective at the Geneva location the 5-20-5 was used in that placement experiment. The rates of application at the different locations were from 600 to 1200 pounds an acre. While the differences in yield were not great, the highest yield in each of the three experiments in 1943 were from the plots where at least half of the fertilizer was plowed under, but with 200 pounds or more applied in bands 2½ inches to the side of the plants and 4 inches deep.

Six hundred pounds of the 5-20-5, all in bands, caused some injury to the roots in the 1942 experiment at Geneva, and so did not produce as high a yield as only 200 pounds in bands. In 1943 with heavy rainfall soon after setting, there was no indication of root injury from the 600 pound band application, but it still failed to produce a profitably higher yield than the 200 pound band application, or as high or as profitable a yield as the combination band and plowing under method. These three experiments this year gave further support to the feasibility of plowing under part of the fertilizer for tomatoes and of supplementing this with light applications in bands.

The results of varying the quantities of nitrogen, phosphorus and potassium in each of these three experiments were not at all conclusive. In 1942, nitrogen gave the most influence on yield on the Ontario Loam soil at Geneva, while potassium gave the greatest influence on the Palmyra Stony Loam, and phosphorus on the Fulton Clay Loam. In the wet season of 1943, the yield differences due to variable quantities of nitrogen, phosphorus, and potassium were not at all outstanding on any of the three soils. The two years taken together look like further evidence that the rainfall and perhaps other climatic factors as well as crop rotations and soil types may greatly influence the quantity of nitrogen, phosphorus and potash that it is profitable to apply. The safe practice is to be certain that the quantity of fertilizer applied is sufficient so that the three common fertilizer nurtients are not limiting the yield of tomatoes.

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HALL, NEW YORK

INTENTIONAL SECOND EXPOSURE

Increasing Profits with Better Tomato Plants and Planting Methods

H. S. SLOAT*

The yield and net return on the tomato crop is directly related to the kind of plants used and method of handling them after they are pulled.

In order to produce strong, vigorous and healthy plants the following practices should be used. Treat seed to kill seed borne diseases. Use clean soil. This can be steam sterilized, or ground on which no tomatoes or other related crops have been grown for three years, use a balanced fertilizer to grow strong vigorous plants that will be sturdy and not too soft. Keep plants free from disease and insect damage by spraying with a neutral copper at weekly or ten day intervals. Careful rogueing of weeds near plant bed, which may be a factor in spreading certain virus diseases.

The Georgia Department of Agriculture has set up definite requirements recommended above, for their growers producing certified plants for sale. These requirements increase the cost of plant production, but the better, well grown plants, even though they cost you more, are your best investment in tomato production.

The way the plants start off in the field will depend on handling the plants after pulling, soil preparation, and insect control.

The ground should have as much humus as possible, either by application of manure, or use of rye grass as a cover crop. It should be plowed early (three to four weeks before planting) and worked down thoroughly with harrow, or disc and roller or cultipacker at weekly intervals, to establish capillary action with subsoil, kill weed seedlings, and allow organic matter to rot.

The best thing to do with plants after you receive them is to open them up by taking half of them out of the basket. Put them in a cool, shady place and plant them as soon as possible. If the sun is very hot, planting in late afternoon and evening, will cause less burning. If plants cannot be set in the field the same day they are received, they may be trenched, by digging a long furrow, and spreading the plants in it, covering the roots with moist earth, and firming it. They may be stored in a cool, dry place, out of hot drying winds or sun. The tops should be kept dry at all times, and the roots moist.

The use of a plant starter in the water at planting time, will help the plant get started more quickly. This quick start will not be so noticeable if fertilizer is applied in the row just before or at time of planting.

Deep and close cultivation should be started four or five days after setting plants.

* Assistant County Agent, Lancaster, Pa.

The Production and Use of Southern Grown Tomato Plants(1)

W. D. MOORE*

The present tomato plant industry in the South is not an over-night agricultural development but rather the result of a gradual expansion over a period of more than twenty years. Prior to 1930 seedling shipments were confined to (rather small consumers in) restricted areas of the North where rail connections with the South were exceptionally good. Since that time, however, many of the large commercial canners located over much of the middle west and the Atlantic seaboard areas have found certain advantages in the use of southern grown plants and have increased their demands to a point where approximately 700 million seedlings are now shipped from the South each spring. This requires the planting of more than 8000 acres of seed beds in the states of Georgia, Florida, Mississippi, Arkansas, and Tennessee. Shipments usually start in Florida about April 15 and end in Tennessee between June 1 and 15.

While this large industry has apparently been profitable to both the growers and the buyers it has not reached its present position without encountering serious problems, some of which relate to disease losses, nutrient deficiencies, plant grades, packing methods, and storage and transportation facilities. A partial solution to some of these problems has already been reached and progress is being made towards a solution of others. Meanwhile, an understanding of some of the operations of the industry should help in properly appraising the strong and the weak points of southern grown plants.

Possibly the most important advance that has been made in the growing of tomato seedlings in the South was the introduction of plant certification by the State of Georgia in 1934. While this system does not guarantee plants that are free of diseases and other physical defects, it does subject them to uniform growing conditions which usually result in superior plants. In the first place only new or properly rotated lands may be used for growing certified plants and only certified seed that has been treated with an acceptable disinfectant may be planted. Each plant field is marked with a card on which is shown for whom grown, the variety, source of seed, date of planting, and dates of spray applications. All fields are inspected at weekly intervals and may be removed from certification for such causes as: **bacterial wilt, Alternaria leaf spot, Alternaria stem canker, bacterial leaf spot,** over-age or woody plants, plants lacking proper nutrition, plants too large or too small, and fields over-run by grass or weeds. The value of these requirements in the eyes of the buyers is reflected in the fact that the certified acreage in Georgia in 1943 was almost 90% of the total planted.

* Pathologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U.S. Department of Agriculture, Agricultural Experiment Station, Tifton, Georgia.

Another improvement of considerable importance was the establishment in 1943 of U.S. Government grades for tomato plants. In these grades minimum length of stems, minimum length of root system, minimum diameter, and certain quality standards are required. Since plant certification does not include plant grades the addition of this system of grading should materially strengthen the industry as a whole. With regards to the use of grades by the public it is important to note that they have been made flexible so that the buyer may establish his own grade if the printed standards do not meet his requirements.

From the standpoint of the buyer, there are a number of important points to keep in mind concerning the problem of harvesting, packing, and shipping tomato plants. First is to have plants of the proper size and age when they are needed in a given locality. That will require a definite seeding date for a definite place; one seeding will not suffice for an early area, such as southern New Jersey, and a late area, such as western New York, even though the plants might be held in the field long enough to be shipped to both sections. Old, hard plants are definitely inferior and should never be used.

Another important point is to have the seedlings properly fertilized during growth. That means the use of a well balanced fertilizer (formula depends upon soil type and location) applied so that the plants grow steadily but not too rapidly. They should reach shipping size in a vigorous growing condition and at the same time be free of succulent or woody tissue. This ideal is approached more easily by interval applications of fertilizer than when the total is applied at one time.

When plants are pulled in the field, they should be brought to the packing shed and packed as soon as possible. Excessive wilting has been found to predispose tomato plants to infection by **Alternaria solani** consequently every effort should be exerted to prevent it. Plants should be wrapped with sufficient wet moss to keep the root systems moist at all times. Since good ventilation is essential plant bundles should never be forced into shipping crates. Shipping temperatures should range between 55 F. and 65 F. Shipping or storage temperatures above 70 F. have been found to be injurious. Recent shipping tests with standard refrigerator cars show that desirable temperatures can be maintained during the shipping period by a combination of ventilation and refrigeration.

When plants are received at their destination, they should be transplanted at once if at all possible. If soil or weather conditions make temporary storage necessary, see that the storage room provides good ventilation for all shipping crates. This applies to the air inside as well as outside of the crates. Stack crates in same method as used in the express cars and never more than five crates high. It is usually well to remove one bundle of plants from the center of each crate in order to allow air circulation through the individual crates. If moss around roots is dry, wet it by dipping crate into water. Do not, however, under any condition allow the plants to stand in water.

Store plants in a room with temperatures of from 55 F. to 65 F. Plants should not be stored any longer than is absolutely necessary. Regardless of the storage conditions, tomato plants deteriorate significantly from one day to another. Some growers resort to "heeling-in" their plants in preference to storage when it is necessary to hold them over for a few days. Our experience has shown that this practice is to be avoided whenever possible. Losses from this method of handling plants through diseases, broken plants, slow growth, and poor yields, will, in most cases, be more than the purchase price of a new lot of plants.

Probably the most useful thing to remember about the problem of growing and shipping tomato plants can be expressed in the word **speed.** Grow the plants quickly, pull and pack with speed, ship promptly and rapidly, and transplant at once. This will not solve all of the problems connected with the industry but it will help with most of them.

(1) Courtesy of Market Growers Journal.

Where the proper facilities and help are available **to grow good plants at home** they should be utilized to the best advantage this year. **Well-grown plants** require seeding about 8 weeks before planting, transplanting 1½ x 1½ or 2 x 2 inches in properly composted soil, growing slowly for short, thick purplish stems and light green leaves, spraying and pulling only as planted. J.M.H.

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SMOKETOWN, LANCASTER COUNTY, PENNA.

Notes on Shipping and Storing Tomato Plants

E. W. MONTELL

Dr. W. D. Moore's discovery that plants will ship and hold better at temperatures between 55 ° F. and 65 ° F. has renewed the interest in shipping and holding plants under partial refrigeration. It might be well to recite some results which canners and growers have experienced when attempting to ship or store plants.

Through necessity growers have been forced to hold plants and naturally they have tried many places. Their concensus of opinion as to the best method of holding plants is as follows:

1. Cover the plants while hauling them from station home.
2. After arriving home, if plants are to be held, place them in the coolest building available, where there is fresh air. Plants placed in damp cellars where there is poor air circulation become moldy.
3. Remove one or two bundles from each basket.
4. If plants in the bundles are very compact and tight, the bundles should be loosened.
5. If plants appear to be drying out too much, dip the roots only. Puncture the paper so the moisture penetrates to the roots. Sprinkle the floor and set baskets on dampened sawdust or chaff.

Because of varying weather conditions such as wet and dry, hot and cold, no set recommendations can be given. Nothing takes the place of good common sense; just remember, if it's rainy and damp, the plants can stand plenty of air; if it's dry and windy, they should not stand in a draught and they will probably need dipping.

As long ago as 1927 and 1928, trials were conducted in the shipment of plants under refrigeration from Georgia and Texas to New Jersey. The plants arrived in a fresh, green condition from each of these states, but when planted they wilted and poor stands resulted.

During the Spring of 1943, experiments were conducted by a Pennsylvania canner in holding plants in cold storage after they arrived. Much the same results were obtained, so it appears as though temperatures which are too low, either while the plants are in transit or storage, are detrimental.

When shipping or storing plants, we should strive to attain the happy medium temperature presented by Dr. Moore of 55 ° F. and 65 ° F. Most of the plants will be shipped this year under a combination of refrigeration and ventilation. When it becomes necessary to hold plants after their arrival, growers should place them in buildings whose temperatures most nearly approach 55 W. to 65 F., keeping in mind that the plants need more ventilation if the atmosphere is wet or damp and that it may be necessary to dip the plant roots if the plants become dry.

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* Mr. Montell is Manager, Agricultural Department, Campbell Soup Co., Camden, N. J.

Purchasing Tomato Plants on Grade

U. S. Standards for Tomato Plants became effective December 10, 1942 and several canners shipped plants in 1943 which had shipping-point inspection. The shortage of labor in the South will probably cause a delay in the general adoption of the U. S. Standards for Tomato Plants, and it will take several seasons of use to enable the U.S. Department of Agriculture to make the necessary changes in the standards so that they may more nearly meet the requirements.

UNITED STATES DEPARTMENT OF AGRICULTURE
Food Distribution Administration
U. S. STANDARDS FOR TOMATO PLANTS
(Effective January 3, 1944)

Grades

U. S. No. 1 shall consist of tomato plants of similar varietal characteristics (1) which are fairly fresh (2), strong (3), and unbroken (4). The stems shall be fairly straight (5), firm (6), but not soft (7), or woody (8). The tops shall be leafy (9), and of normal color (10). The length of the main tap root (16) shall be not less than 1-$\frac{3}{4}$ inches.

The plants shall be free from decay, early blight (Alternaria Solani), and bacterial canker (Phytomonas michiganesis), and from damage (11) caused by other diseases, freezing (12), heating (13), foreign material, insects, mechanical or other means.

Unless otherwise specified, the diameter (14) of the stem of each plant shall be not less than 3/16 inch and the length of the stem (15) shall not be less than 6 inches nor more than 9 inches.

Tolerances

In order to allow for variations other than size, incident to proper grading and handling, not more than a total of 10 percent, by count, of the tomato plants in any lot may be below the requirements of this grade, but no tolerance shall be allowed for decay, early blight (Alternaria sollani), or bacterial canker (Phytomonas michiganensis). In addition, not more than a total of 10 percent, by count, of the tomato plants in any lot may not meet the specified size requirements, but not more than 5 per cent shall be allowed for plants which are smaller than the minimum diameter required.

Standards for Bunching

Tomato plants may be packed loose or in bunches. When bunched, the number of plants per bunch shall average not less than 50 plants in 50-size bunches and not less than 100 plants in 100-size bunches.

Standards for Packing

The plants in individual bunches shall be arranged with the tops of the roots in approximately the same plane and the roots shall be protected by an adequate supply of moistened peat moss, sphagnum moss, or other suitable packing material with moisture holding capacity, well scattered over the roots in the bunch and held in place with a paper wrap. The bunches shall be packed upright and fairly tightly in

containers of sufficient height to accomodate the size of plants packed and in such a manner as to not cause bending or excessive bruising of the plants.

In order to allow for variations incident to proper packing not more than 10 percent of the containers in any lot may fail to meet the packing requirements.

Unclassified shall consist of tomato plants which have not been classified in accordance with the foregoing grade. The term "unclassified" is not a grade within the meaning of these standards but is provided as a designation to show that no definite grade has been applied to the lot.

Definitions of Terms

As used in these Standards:

(1) "Similar varietal characteristics' means that the plants have the same general character of growth and color.

(2) "Fairly fresh" means that the stems, roots and foliage are not excessively wilted, limp or flabby.

(3) "Strong' means that the stem is fairly stiff and sturdy enough to hold the top in a reasonably erect position.

(4) "Unbroken" means that the stem and that portion of the main tap root remaining on the plant after pulling are not broken.

(5) "Fairly straight" means that the stem is not more than moderately curved or crooked.

(6) "Firm" means that the stem about midway between the growing tip and the base does not yield more than slightly to moderate pressure of the fingers.

(7) "Soft" means that the stem about midway between the growing tip and the base yields more than slightly to moderate pressure of the fingers.

(8) "Woody" means that the stem is excessively hard and fibrous.

(9) "Leafy" means that the leaves of the plant are of normal development and not small and under-developed.

(10) "Normal color" means that the plant shows a healthy green color.

(11) "Damage" means any injury or defect which materially affects the normal growth, shipping quality, or general appearance of the plant.

(12) "Freezing" means injury to the plant caused by excessively low temperatures.

(13) "Heating" means injury to the plant caused by excessively high temperatures.

(14) "Diameter" means the greatest thickness of the stem measured at the first internode above the cotyledons.

(15)"The length of the stem" means the distance from the top of the underground root system to the growing tip of the plant.

(16) "Length of the main tap root" means the distance from the top of the underground root system to the end of the largest central root.

Issued December 15, 1943.—C. W. KITCHEN, Deputy Director, Food Distribution Administration.

The Garden State Tomato Variety (formerly Hybrid No. 37)

D. R. Porter*

Garden State is the name which has been given our tomato hybrid No. 37. This variety has made a respectable record during the past four years under a wide range of soil and other environmental conditions. The most extensive tests have been in New Jersey, Pennsylvania and Illinois.

Originally we were impressed by the earliness of Garden State—not the type of earliness characteristic of Earliana and Bonny Best—but by its tendency to reach a production peak well ahead of Rutgers and Marglobe.

After four years tests, Garden State has demonstrated more than earliness—it has consistently outyielded Rutgers and Marglobe in New Jersey and Pennsylvania. It has become popular with growers. The performance record is such that Garden State is a valuable new variety. Characters other than yield and season will be mentioned later.

History. Garden State was created by Mr. W. E. Belleville of the Campbell Soup Co., under the direction and encouragement of Mr. Harry F. Hall, formerly of this Company and recently retired. It resulted from crosses involving Pritchard, Marvel and Pink Topper. The early breeding work was initiated in 1931 in our greenhouse at Riverton, N. J. Significantly, none of the three varieties used in the above crosses is of value to growers of canhouse tomatoes. Pink Topper is more or less a curiosity, Marvel is almost non-existent and Pritchard is seldom used for a canhouse crop. However, each of these three varieties has contributed to the successful development of Garden State. This is not without precedent—many breeders have developed valuable vegetable varieties by crossing types or varieties possesing many inferior but a few superior characters. In the "melting pot" the inferior characters have been lost while the superior characters have been retained and so combined that the new variety has demonstrated merit.

Yield. Records of Garden State vs. Rutgers were obtained in 65 separate tests, conducted in New Jersey, Pennsylvania, Ohio, Illinois, Wisconsin, Indiana, Connecticut, Virginia, New York and Missouri from 1940 to 1943. The average yield of Garden State was 10 tons and of Rutgers 8.5 tons per acre.

While the two varieties yielded equally in Lancaster Co., Pa. in 1942, the records for 1943 are 10.1 tons for Garden State and 8.1 tons per acre for Rutgers. The highest yield for Garden State in Pennsylvania in 1943 was 19.2 tons per acre.

In northern Illinois in 1943, the average yield obtained by 8 growers

* Research Department, Campbell Soup Company, Riverton, N. J.

of Garden State was 12.8 tons per acre, with one grower obtaining a yield of 17 tons. All of these 8 growers have requested an increased acreage of Garden State for 1944.

In New Jersey in 1943, the record yield for Garden State was 20.6 tons with 12 growers obtaining more than 10 tons per acre. Admittedly, it was relatively easy for growers to obtain yields above 10 tons per acre in 1943 in central New Jersey, due mainly to favorable weather during August and September.

Season. Garden State is not early in the sense that it yields ripe fruits earlier than Rutgers or Marglobe. In fact, Rutgers usually matures ripe fruits earlier than Garden State. When we claim earliness for Garden State we mean that its production peak is reached sooner than for Rutgers. We measure the degree of earliness by the per cent of the total crop which ripens before August 25.

The tests on earliness were both numerous and widely scattered, and were conducted over the 4-year period, 1940 to 1943 incl. By August 25, Garden State had matured 6 per cent more of its total crop than Rutgers. Thus, Garden State is more apt to escape the unfavorable weather which frequently prevails during late August and early September in central New Jersey. This character may be one of the reasons why Garden State has so consistently outyielded Rutgers—it apparently matured its crop more rapidly.

Garden State in eastern Pennsylvania in 1943, outyielded Rutgers with 6 growers by 2 tons per acre and after the first 4 pickings had outyielded Rutgers by 1.2 tons per acre.

Again in eastern Pennsylvania in 1943, a total of 46 men grew Garden State. Neither yield nor season records were obtained, but of these 46 men, 23 stated that they preferred Garden State to Rutgers, 13 men had no preference, and only 10 preferred Rutgers to Garden State. Conclusions are therefore obvious.

Average Fruit Weight. We measure average fruit weight in terms of the number of ripe fruits required to fill to capacity a five-eighths bushel basket. A few such comparisons of Garden State vs. Rutgers were made in 1942 but on 25 occasions in 1943, we made comparative counts for these two varieties. Results were as follows,

For Garden State—145 fruits per basket

For Rutgers—160 fruits per basket

Thus, in a comparatively dry season, the fruits of Garden State were larger than those of Rutgers. In limited tests in 1942, Garden State averaged 116 and Rutgers 120 fruits per basket while in two tests in 1941, the average for Garden State was 132 and for Rutgers 151 fruits per basket. Thus, during three years, Garden State has been larger-fruited than Rutgers.

Other Comparisons.

Color: slight advantage for Rutgers.
Flavor: no difference—both acceptable.
Vitamin C: no difference—both acceptable.
Yellow-Top—slight advantage for Rutgers.
Fruit Cracking—slight advantage for Rutgers.
Trimming Waste—slight advantage for Rutgers.
Blight & Leafspot—slight advantage for Rutgers.
Fusarium Wilt—slight advantage for Garden State.
Pulp Percentage—slight advantage for Garden State.
Blossom-End Rot—slight advantage for Rutgers.
Ease of Picking—slight advantage for Rutgers.

Garden State, therefore, is not without defects—what vegetable variety is perfect? We and other breeders are conscious of these defects and work is under way to correct them.

Seed supply for the 1944 crop is limited but adequate for small acreages with many growers. We suggest that men who have not grown Garden State plant 3 acres or less in 1944 and study it from the standpoint of fertilizer response so that they may plan for 1945.

Stock seed has been released to several commercial Seedsmen and their rate of seed increase will probably be governed by the demand. These Seedsmen will have no seed of Garden State for sale for the 1944 crop.

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Tomato Disease Situation in Pennsylvania

R. S. KIRBY*

Tomatoes are attacked by more diseases than most other crops. Of the 74 diseases known to attack tomatoes at least 25 are known to have occurred in Pennsylvania.

The Federal Plant Disease Survey office records show that during the past ten years diseases have been responsible for an average loss on tomatoes of 26.4 per cent. The most destructive single disease was Alternaria early blight canker. The fungus causing this disease caused an average loss of 10 per cent. Other important diseases each averaging two to five per cent average loss are anthracnose, mosaics, spetoria leaf spot and damping-off. Other diseases such as bacterial canker, bacterial spot, bacterial wilt, fusarium wilt, late blight and leaf mold were destructive in some fields but were seldom responsible for more than a one per cent average loss.

Trends in Disease Loss:—With the large increase in tomato growing in Pennsylvania the old truism that the larger the population of any crop in an area the more disease, came into action and anthracnose increased many times in severity during the past ten years. New diseases have appeared. Leaf mold and bacterial wilt in 1943 were destructive for the first time in any Pennsylvania tomato fields.

The amount of disease occurring in a tomato field depends on the following factors:

1. The amount of disease brought into a field on tomato plants.
2. The amount of disease organisms that are living on decaying plant parts and in the soil.
3. The presence of weeds that may carry tomato diseases.
4. The proximity of diseased tomato, potato, or other crops from which diseases may spread.
5. The occurrence of weather favorable to the spread of tomato diseases.

With even larger increases in acreage anticipated tomatoes will be planted more often in the same field and with so many diseases ready to attack tomatoes serious losses can be expected each year unless a control program is adopted to prevent the spread of disease.

DISEASE CONTROL PROGRAMS

To be successful a disease control program must be one in which both the plant producer and the tomato grower take equal responsibility.

If the plant producer delivers severely diseased plants to the grower it is almost impossible for the grower to produce a high yielding crop. If the plant producer delivers clean plants and the grower sets them in a field which during the past year or two had diseased tomato plants or plants in a field near other tomatoes or other crops carrying destructive tomato diseases the work of the plant producer is nullified and the grower is likely to have a diseased, low yielding crop.

* Extension Plant Pathologist, The Pennsylvania State College.

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FOR 1944

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The strength of these stocks is deeply rooted in a breeding program which traces back for 20 generations. Our routine of producing two stock-seed crops per year is, we believe, unique in Tomato seed production. One of these matures in New Jersey in August; the other matures in Florida in March. Stock-maintainance and stock-improvement are carried on through single-plant selection and through hybridization. The latter has recently developed two interesting new strains which are now being perfected and which will be tested in twelve different areas in 1944.

Planters of Stokes Tomato Seed are protected by a package which is sealed with a certificate covering State Certification seed-disinfection (new Improved Ceresan), germination and date of the germination test. As a contribution toward holding the line, the prices for 1944 remain unchanged from our catalog prices of 1941, 1942 and 1943. Because of the extraordinary demands, our inventories are already heavily drawn against. Send for 1944 folder.

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Breeders and Growers of Fine Tomato Seed

VINCENTOWN, NEW JERSEY, U. S. A.

PROGRAM FOR THE PLANT PRODUCER

The plant producers part in the disease control program is to deliver to the grower tomato plants which are free of destructive tomato diseases.

Excellent programs for growing disease-free tomato plants are printed in several bulletins and these should be consulted for details. Such programs usually include an effective seed treatment like hot water combined with New Improved Ceresan. Planting the seedlings in soil free of disease. Spraying the seedlings with fixed copper sprays. Keeping the young plants away from weeds, flowers, cultivated crop plants and tobacco which may carry virus diseases. The plant producer should make every effort to reduce the time that the pulled tomato plants are held in bunches or baskets before delivery to the grower. Both northern and southern plant growers can produce tomato plants free of disease if an adequate disease control program is followed.

PROGRAM FOR THE TOMATO GROWER

The grower must also do his part in preventing tomato diseases. The writer has seen parts of tomato fields that were nearly free of Alternaria canker where the plants were planted as soon as received. Other parts of the same field had 25 per cent of plants severely damaged with Alternaria stem cankers. The only difference was that the plants had been held in bunches or baskets for seven to ten days between the first and second planting. Holding tomato plants in bunches or baskets for any length of time allows disease to spread from one infected plant to many or all of the clean plants.

1. Tomato plants should be set as soon as possible after they are received if they are to be kept disease-free. If the weather prevents planting at once the bunches should be broken and the plants "heeled" in or spread out thinly in a cool place.

2. Growers should allow three and better four years intervals between crops of tomatoes in any field. Many tomato disease-causing organisms live from one to three years on decaying tomato plants or in the soil. Too frequent cropping with tomatoes allows these organisms to attack the new plantings and reduce yields.

3. Potatoes, eggplants, and peppers are susceptible to several destructive tomato diseases and growers therefore should avoid having tomatoes follow these crops.

4. Growers should keep weeds out of their fields to avoid disease losses. Weeds such as horsenettle, catnip, jimson weed, milkweed, pokeweed, and groundberry act as carriers of mosaic viruses and certain fungi. Similarly certain crop plants like tobacco, potatoes, peppers, cucumbers and eggplants carry diseases and should as a rule not be planted next to a tomato field.

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5. **Spraying and dusting for disease control.**

Much experimental work has been done to determine whether spraying is an economically sound practice for disease control on tomatoes. The results often have been contradictory, giving decreases about as often as increases. In spraying trials in Pennsylvania when alternaria early blight and septoria leaf spot were very severe, spraying with Bordeaux 4-4-50 usually gave increased yields, but when plants free of disease were planted into fields which had not grown tomatoes for several years, the more sprays that were applied the more the yield was reduced below the unsprayed plots. The results in Pennsylvania and other states show that the application of 4-4-50 Bordeaux to disease-free plants hardens the leaf tissues causing a dwarfing of the plants and a killing of some of the blossoms. Thus spraying with 4-4-50 Bordeaux only gave yield increases when the disease was so severe that its control more than overcame the damage caused by the spray. It has been shown that less injury occurred when a fixed copper spray or a low lime bordeaux (4-2-50) was used.

Copper sprays have not been effective in preventing anthracnose. During the past few years a new organic chemical known as Fermate has been shown to be effective against anthracnose. Fermate by itself reduced the leaf blights but indications are that it should be supplemented with some copper sprays when leaf blights are severe.

1943 Spraying Results:—

Dr. L. O. Weaver and I. L. Yoder applied three types of sprays and a dust to different sections of a field of Rutgers tomatoes in Snyder County. Four sprays or dusts were applied at weekly intervals to each section starting July 30. The materials used and the yield of ripe tomatoes were as follows:

Spray or dust applied	Yields in Tons per acre
Unsprayed	6.63
Fixed copper dust*	7.18
Fermate Spray 2 pounds per 100	8.97
Fixed Copper spray* 6 pounds per 100	9.46
Bordeaux* 4-2-50	9.91

* Copper oxychloride sulphate. Unfortunately due to dry weather there was insufficient anthracnose to make counts.

Looking Forward

TO NEXT SEASON

Here Are A Few Tips You Might Appreciate:

In planning your spraying program you will want to use sprays which effectively control worms and scab and the many other diseases which attack fruit. You will find these materials in the Dow line of sprays.

Your first spray, of course, is the dormant to control aphis, scale, bud moth, pear psylla. Either DN Dry Mix or Dowspray Dormant will do the job for you.

For scab and other fungus troubles we offer you "Mike" Sulfur, Dry Lime Sulphur or Lime Sulphur Solution. Use the one best suited to your particular conditions.

For leaf spot and shot hole fungus on cherries, consider Bordow, our copper fungicide and, of course, Dow Lead Arsenate for worm control.

Consult your dealer about these and the other Dow products which have served fruit growers so well for more than 30 years. A spraying chart will be sent you upon request.

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In Lancaster County H. S. Sloat and the writer had three tomato spraying demonstrations. Yields could not be obtained but the following data were taken in regard to disease occurrence and defoliation. Anthracnose averaged 10.3 per cent on the unsprayed tomatoes while nearby plants receiving one or two Fermate sprays had only 1.3 per cent of the tomatoes infected with Anthracnose. The application of two Fermate sprays reduced the number of alternaria leaf infections and the amount of defoliation by nearly one-half. The application of two copper sprays to the young plants followed by one Fermate spray reduced the number of alternaria leaf infections and the amount of defoliation by nearly two-thirds.

Conclusions on spraying:—

If Fermate or alternate sprays of copper and Fermate continue to reduce anthracnose and disease defoliation, tomato spraying may become a paying farm practice.

Demonstrations on spray material combinations will be carried on with growers to show how generally tomato spraying should be adopted.

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TAPPERSON SEED CO.

ALLENTOWN, PA.

Picking Tomatoes

RAYMOND S. HOVIS*

Training of Pickers

The number of new pickers to be trained this year should be less than last year. A number of those persons who picked tomatoes last year will return this year. This will serve as a nucleus about which to build this year's program.

Last year Mr. Harry Sloat, assistant county agent, Lancaster County conducted picking demonstrations at two work camp centers in the county. This phase of the program should be expanded in order to give more assistance to larger numbers.

Much of this training program will fall back on the farmer. He will have to tell his hired help just exactly how he wishes his tomatoes picked. The color chart showing grades of tomatoes distributed by the Pennsylvania Agricultural Extension Service is most helpful. Every farmer should have this chart in his possession.

Supervision of Pickers

Too much emphasis cannot be placed on the importance of supervising pickers. Where school children are used evclusively supervision becomes a necessity. The answer to the question, "How can I afford the time to supervise my pickers?" can be answered by the counter question, "Can I afford not to supervise my pickers?"

If the farmer, himself, cannot afford the time to do the supervising he should consider employing a competent person for that work. The supervisor's pay can be made up by increased production from vines protected by careful picking and by obtaining a higher percentage of number one tomatoes.

Work Record of Pickers

Keeping a work record of persons placed by the Emergency Farm Labor Office can be most valuable in the elimination of undesirable workers. The experience of last year clearly demonstrate that some workers have to be eliminated because of personal inefficiency or because of the general low morale they create in the group. The problem should receive more careful attention this year.

In judging the work record of school age children farmers will have to give careful consideration to the length of the work day. The level of efficiency for most children of school age begins to drop rapidly after six hours of work.

---

* Mr. Hovis, 23 Kready Ave., Millersville, Pa., assisted the Lancaster County Agricultural Extension Association in Emergency Farm Labor Placement in 1943.

Schools and the Work Program

Most school districts will probably consider September 5 or 11 as appropriate dates to begin the 1944-45 school term. Some districts will no doubt select September 18 as the starting date.

There are several things to consider in the selection of an opening date. Legally the school term in this state is 180 days. A late start means a late ending in the spring. In those districts where the tomato acreage is large school authorities should consider the latest practical date. Schools can start as late as September 18 if vacation periods are cut to a minimum.

Two trends are evident in Lancaster County. During the summer of 1943 some school districts postponed the opening date a week or more as a result of an appeal from the Emergency Farm Labor Office. The other trend noted was the fact that school authorities placed a liberal interpretation on the school attendance laws in order to assist in the harvesting of the crops. In many places school administrators acted as recruiting agents for farmers in distress. As a whole the school authorities were cooperative.

A change of policy in dealing with the schools does not seem desirable. However, school administrators and school boards should be urged to postpone the opening date as long as possible. In several instances missionary work will have to be done to convince the school authorities of the seriousness of the farm labor problem.

HIGH SCHOOL STUDENTS PICKING NEAR NORTH EAST, PA.
Tomatoes in the drive-row are picked, while strong men handle baskets picked by women and children, before loading the red-ripe tomatoes.

Interest Continues in Tomato Picking Machines

JESSE M. HUFFINGTON

Tomato picking machines as originally designed by Snavely Garber and followed up by Arthur Young and other hard working Lancaster County growers, were intended to be easy on the back and leave the vines unbroken and practically unmolested. The latest development is a wing type tomato conveyor which eliminates the handling of baskets and enables the picker to devote his entire time to picking tomatoes. As constructed by Samuel Mast, Boyertown, R. 2, Berks County, the equipment consists of an old truck with two additional transmissions to increase power and slow down speed, and a conveyor belt driven by power taken off on one of the transmissions.

Although this type of tomato picking machine does not provide free rides, Mr. Mast enumerates the following advantages:

1. Each picker can help the other, avoiding a slowing down of the entire crew.

2. The work is easier than hand picking because the lifting of baskets is eliminated.

3. Careful picking, according to U. S. No. 1, grade is easily possible.

4. Construction, during ordinary times is not costly (about $150).

5. Easier to get pickers.

6. Vines are injured less than hand picking.

7. Time is saved. Twelve pickers harvested 600 baskets of tomatoes in the same length of time it required 17 pickers to harvest 400 baskets by hand on a comparable neighboring field. The actual total cash cost per ton, however, was about the same as by hand.

The disadvantage, Mr. Mast states, is that the picker cannot be used when the field is wet.

A record of the cost of picking with this type of machine in 1942 is as follows: 107.3 tons of tomatoes on 29 acres, 2016 total picking hours at 35c, 18.79 hours or $6.58 per ton and 11c per $\frac{5}{8}$ bu. The yield per acre in this season was only 3.7 tons and, unfortunately, records on the larger, 1943, crop are not available. A comparison of movements required in picking and placing tomatoes on the conveyor as compared to in the basket, as seen in the accompanying illustrations of machine and hand picking, shows that the conveyor system may be helpful in using children or old people who cannot easily lift the baskets but the close proximity of the basket in hand picking allows the full use of both hands with a minimum of steps. A number of improvements have been suggested by Mr. Mast and a careful study of labor requirements and costs should be made before making any general recommendations as to the use of tomato picking equipment. This information is presented, through the courtesy of Mr. Mast, in the interest of further progress.

INTENTIONAL SECOND EXPOSURE

Walking Type Tomato Picker in Operation.

The lifting of baskets is eliminated and the tomatoes are hauled to the end of the field. Equipment includes an old truck, two additional transmissions (or one with 5 speeds) and a 6-inch conveyor elevator covering 36 feet, driven by the power take-off on the third transmission. Picking near conveyor saves time.

★

An efficient tomato picker is able quickly to select tomatoes with 90% red color and those with two-thirds red color with more than 10% but not over one-fifth loss caused by defects. He uses both hands and handles the vines carefully. A basket, located conveniently, increases the speed in removing tomatoes from the vines, since about 80% of the picker's time is spent in moving the hands from the vines to basket and back again.

Tomato conveyor, attached to one side of the truck supported with cable and braced with rod in front of truck, and elevator which empties the tomatoes in a basket. The Mast tomato picker. Counter-weights are placed on the opposite side to balance the conveyor.

Large loads of tomatoes delivered soon after being picked mean higher quality, greater profits to both grower and canner and more efficient use of labor and vital materials.

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INTENTIONAL SECOND EXPOSURE

Eliminating Congestion at the Receiving Station

L. D. FERO*

The problem of eliminating congestion at the Tomato Receiving Station is not a one-man job. Neither is it an operation that can be entirely controlled by the Receiving Station Management. And certainly it is not within the power of the grower to eliminate the situation by himself. Since the problem cannot be laid entirely on either the doorstep of the Station Management or the grower, it seems logical that steps toward its solution lie in close co-operation between both parties.

It would seem that the tomato grower is in the best position to first see the periods of unusually heavy harvesting and seriously accept the responsibility to pass the word along to the station manager. It is certainly to the grower's advantage to save an hour or two, or even just a half hour, at the station, which might be possible if the station man was advised what to expect. In the majority of instances, however, it seems that the first the grower gives any concern to getting unloaded is after he gets to the receiving station and finds himself in a long line of tomato trucks. Usually after this happens there is not much that can be done but work out of it.

There is one positive solution to the tomato station congestion problem if the growers and station manager will each agree to do their part. I refer to scheduled tomato receiving which is a system by which each load is delivered and unloaded on a definite time appointment. This is some small trouble to the grower perhaps as he must schedule a time to deliver his load, or loads, the day before he wants to take them into the station. The station man obligates himself to unload the grower at the time agreed upon. It is also his responsibility to set up and maintain a system that will keep a constant flow of tomato trucks arriving each half hour throughout the day.

Obviously the system will not work unless all growers at a station use it. It is not a new idea, since it has been used many years by some companies very successfully. If you like the idea speak to your field man. Some companies have provision to use the system stated in their tomato contract and will be glad to put it in effect if the growers desire it.

* Head Field Service Man, H. J. Heinz Company, Chambersburg, Pa.

* * *

ALAN WAREHIME‡

We used the field man who had charge of the contracting and the planting of tomatoes as the manager or traffic manager during the tomato canning season.

‡ Manager, Hanover Canning Company, Hanover, Pa.

His job was to get the loads from the scale house through to the inspection stands and then placed at various intervals along the drag which carried the tomatoes into the plant. This drag was approximately 80 feet long and tomatoes could be stacked on either side. By placing the various loads at intervals along this drag approximately 10 vehicles could be unloaded at one time. If the stock pile of tomatoes was adequate the baskets of tomatoes from the vehicles were stacked along the drag. If the stock pile was low at least half of the unloading trucks were placed immediately on the drag.

In addition, this traffic manager had charge of sending hired trucks to those farmers who wanted tomatoes hauled by the company. This eliminates tomatoes from staying too long in the field after picking. Also, small loads may be forgotten, and would keep in a systematic order tomatoes to be brought into the plant as farmers give their hauling orders.

It also eliminated arguments between growers and canners relating to weigts, grades, and basket check-offs, and gave the grower a chance to criticize; at the same time the condition could be changed right on the spot rather than waiting until the next season.

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How the Appointment System Works

EARL GRATZER*

The Appointment System for delivery of tomatoes as it is in practice was originally started to relieve pressure from certain rush hours of the day and to obtain a more uniform delivery throughout the whole day.

By telephone, or by direct contact, the growers or truckers make appointments as to when they wish to make a delivery. It is requested that they make their appointments at least 24 hours in advance of proposed delivery and to state at that time approximately how many baskets they expect to have. Most growers pick tomatoes on certain days each week and many make appointments a week ahead or at time of one delivery for the next.

The receiver, knowing how much he can handle in a given time, can thereby govern the incoming trucks and thus eliminate almost completely any line-up of trucks or waste of time by growers, truckers, and receivers.

In small and large receiving stations alike there are bottlenecks through which all this traffic must travel and through which it can travel only at a certain speed. Jamming the bottleneck does not increase the speed with which the produce is received but, instead, obviously wastes time for every one. Inasmuch as the receiver knows how fast traffic can pass through his slowest procedure—by allotting so many truck loads or so many baskets to each 15-minute period a jam or line-up can be avoided.

During the peak picking of tomatoes it will possibly be necessary to increase the receiving hours each day in order to get more 15-minute periods. That would mean that receiving was being done at capacity all day, wasting no time for the receiver, and if it were necessary to add two or three hours onto the receiving day the growers would not have to waste that time standing in line after the deadline.

* Branch Manager, Standard Brands, Inc., Loudon Division, Lititz, Pa.

"HOLMES SEEDS

Are for the Critical Market Grower who desires to get pure, high yielding strains."

HOLMES SEED CO., CANTON, OHIO

M. B. Ober reported at the Lancaster Tomato Meeting, January 26: "Canners get into lots of difficulty sometimes when there is a very long line of tomatoes. Make an appointment to take your tomatoes and you don't have to wait to unload, starting at 7 o'clock in the morning until 6 in the evening. This takes the pressure from certain days of the week. We know just how many tomatoes are coming in and you don't have to be there until your time. Make appointments when you start picking tomatoes and in case of rain you make another appointment. This works out nicely and the growers and canners like it."

Mr. Kane replied: "I have talked with Mr. Ober on his system of appointment but I don't believe in it. We have farmers who make four trips a day. We co-operate with you by having help there to make those late trips."

* * *

K. S. ALWINE†

With the exception of a few instances our unloading went rather nicely in 1943. We believe it is due to the fact that we scheduled the loads, and of course, the co-operation of our growers in adhering to the system.

Another thing to take into account is the fact that the yield may not have been as good due to weather conditions.

Quality is another factor that helped us a great deal. The quality for the season just past was very good and naturally our plant could handle more tomatoes than if the quality had been worse.

We couldn't close this report without again stating that we think scheduling is the system that will permit the grower to get away from our plant promptly.

† Secretary to The C. H. Musselman Company, Biglerville, Pa.

LANCASTER BONE FERTILIZER CO. Inc.

Quarryville, Pa.

Manufacturers of *"Conestoga Brand"* fertilizers

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Avoiding Losses by Prompt Delivery of Tires

Mr. Eshleman, Lancaster Ration Board, reported in Lancaster on January 26: "The great crisis in truck tires is only approaching; at the present time I understand that there will be enough tires for pleasure cars, but that is not true of truck tires. The government is taking practically all of the truck tires for machines of war. I don't know what I can tell you to do, except tell you some of the things that cause delay in tire ration. Oftentimes the application is not properly filled out and must be returned to the applicant. Another cause for delay is that some leave their application with their tire dealer to place with the Board, but you yourself should see that it gets there. Oftentimes the application is not turned over to the board by the tire dealer until two to three weeks later. Time and time again we have had calls as to why they did not get the tires. Our tire quota for this area is 500 tires and we are supposed to issue them at one-quarter each week. When we have applications for 500 tires on hand and get more applications during that period, of course, some have to wait. It is up to the Board to decide which is the most important to fill first. Apply in time. That is hard to do too, because if there is still 100 miles remaining for that tire there is not to be a tire issued for that truck. Every possible mile must be gotten out of the old casing before it is turned in. That will mean that some tomato growers will be caught in an emergency during harvesting season. See that the application gets to the board. You may mail it along with the ODT certificate after seeing that it is filled out properly. The ODT certificate will be mailed back to you immediately. Many think they are not receiving tires because the tire certificate did not come along back with the ODT certificate. We must be careful not to give tires to trucks that are not in essential work; we will hold the application until we know for certain. Be sure your inspection cards are filled out. Each inspection on a truck application should show condition of each tire that they are applying for, along with the serial number of that tire. Many have to be returned for that. If you find that you are going to need tires during the tomato harvest season, apply beforehand. Attach a note to the application stating that your tomato harvest is approaching and you will need these tires at the beginning of the harvest season, which will begin July 20 or August 1. If we have something like that to go by we do try to fill the application in time. Personal relationship: We do not like to be bothered at our homes but if you have a chance to get to the Ration Board or see someone on the Board and explain your case that also helps. We will try to do the best we can."

* Mr. Reeder L. Eshleman represented the Lancaster Tire Ration Board at the Tomato Meeting in Martin Auditorium.

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